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ORIGINAL ARTICLES.

PRACTICAL FOOD PRESCRIBING.

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In presuming to add to the long list of papers upon infant feeding; I disavow at the outset any claim to a new method. I believe, however, that some phases of the subject can be presented more clearly than they have yet been and that a method already devised may be made still more simple, so simple, in fact, that any practitioner can use it without learning complex methods or consulting text-books and formulas. I have tried to put theory aside and tell *how*, not *why*.

The knowledge required by the practitioner to become a good infant feeder is considerable and may be classified as follows: (1) A knowledge of breast milk; (2) artificial foods, their chemical and physical composition; (3) good cow's milk and how it is to be secured; (4) the differences between cow's milk and breast milk; (5) the modifying or adapting of cow's milk to each individual infant; (6) the character of the food required in health and disease.

Breast Milk.—The proposition that the child's natural food should be the standard by which to judge artificial food is too rational to require discussion. Breast milk, therefore, has been universally adopted as that standard. But it may be said that there is no standard for breast milk, for no two samples are precisely the same and no two chemists give exactly the same analyses; true as regards minute percentages, which means that there is no one strength of food provided by Nature for every infant; untrue as regards the fact that all breast milk consists of fat, milk sugar, proteid, salts, and water. Although there are some who differ, the majority of authorities still give the following as the composition of average breast milk: fat, 4 per cent.; sugar, 7 per cent.; proteid, 1.5 per cent.

Artificial Food.—Without entering upon prolonged discussion, it is sufficient to say that all so-called infant's foods are deficient in one or all (most of them in all) of the important elements—fat, milk sugar, and proteid. Fat is almost universally lacking, but its importance is evident from its large relative amount in breast milk. Not only are the foods lacking in chemical composition, but they are in large measure derived from vegetable and not from animal sources. The organs of the infant were not designed to digest vegetable substances.

Diluted condensed milk always produces rickets if its use is prolonged, for it is deficient in fat and proteids. A dilution of 1 in 12, the one most commonly used, contains but one-eighth the amount of fat and one-third the amount of proteid of average breast milk. Double that strength contains but one-fourth the proper amount of fat, but the sugar is so excessive as to soon upset the stomach. A food so wide of the standard is not a proper one for an infant. Notwithstanding certain drawbacks, cow's milk, properly modified, is unqualifiedly the best artificial food for infants.

Good Cow's Milk and How It Is Secured.—Notwithstanding all that has been written upon the subject, the profession is not sufficiently awake to the importance of clean milk, nor has the average practitioner studied sufficiently the methods necessary to obtain it. It is the growth of bacteria that renders cow's milk unfit for food. But it is impractical for practitioners to count the bacteria or to judge of the number present by appearances. It has been observed, however, that there is a close relation between the acidity of the milk and the deleterious bacteria. "Milk with the least acid," says H. L. Russell, "as a rule is the freest from spore-bearing bacteria." Taking advantage of this fact, a method has been devised by Farrington by which the acidity of milk may be easily determined by means of alkaline tablets. They are largely used in the dairy industry. A special form of these tablets is now made for the use of physicians and are known as Ideal Milk Testers. By their use the acidity of milk may be quickly tested and its safety as a food may be quite accurately judged.

One of the most important details in the handling of milk is rapid cooling immediately after milking. It is the belief of many competent observers that Pasteurizing is not necessary when adequate precautions are taken against the entrance of bacteria, and the milk is immediately cooled below 60° F. and not allowed to rise above that temperature. In milk that is immediately bottled and cooled, the cream will rise almost completely in four hours. The milk of several cows is better for an infant than that of a single cow, for it will vary less in its composition from day to day.

Milk should be sterilized only in rare instances. It is not necessary to here discuss the objections to sterilization. Milk should be Pasteurized when there is the slightest doubt as to its cleanliness and when it cannot be kept below 60° F. Pasteurizing is designed to accomplish one result and one alone—the destruction of bacteria. It does not render the milk more digestible nor diminish in the slightest degree the necessity for

modifying it. Neither will Pasteurizing destroy poisonous products which have already been formed. It is infinitely better to prevent contamination by proper methods of production and handling than to try to prevent the results. Under present conditions, however, Pasteurizing is often a necessity and has saved thousands of infant lives.

Breast Milk and Cow's Milk.—The proteid of cow's milk is from two to three times greater than that of breast milk. In modifying cow's milk, therefore, the proteid must be reduced by diluting the milk. This reduces the fat and sugar also. Hence fat and sugar must be added. The theoretical problem is simple: Reduce the proteid by diluting the milk; increase the fat and sugar by adding those elements. This process is known as modifying, and is nothing but changing the constituents of cow's milk to make them available for the use of the human infant. Modified milk is not of any particular composition, nor is there any particular modification that suits every infant. It is simply milk adapted to each case. Misunderstanding of this point has been perpetuated by the persistence with which most writers upon feeding have used formulas, supposed to be proper for different ages. Such a course has practically made modified milk nothing more than a series of mixtures. It has prevented the more general acceptance of the method because no practitioner could remember the formulas, and would not carry the books and magazines with him, to be opened and copied every time he wished to prescribe food for an infant. In the quiet of the office such formulas may be useful, but most food prescribing is done in the home of the patient.

What is needed by the general practitioner is a method by which he can successfully prescribe food without the use of books and mathematical calculations. Such a method is at hand and is almost as simple as diluting condensed milk.

Modifying Milk.—It is useless to think of milk as being of a definite composition. It is not. Some is rich and some is poor, but the top nine or ten ounces of cream and skim milk from a quart of any milk contains fat three times the proteids. The top fifteen or sixteen ounces contains fat two times the proteids. Hence between these nine and fifteen ounces, we can get fat anywhere from two to three times the proteids, which is the range in woman's milk. By using a one-ounce dipper, devised by Dr. Chapin, for removing the top milk, twenty-five different ratios between fat and proteids can be obtained from one quart of milk.

The one object in modifying milk is to obtain a mixture upon which the infant will thrive. A pediatric specialist of large experience will find such a mixture more quickly than will a general practitioner with small experience. Specialists have no secret process, however. They try combinations, just as other doctors must. If they have any secret, it is a very open one and may be thus expressed: *Begin on a weak mixture and*

work up to the point of tolerance. The average practitioner does precisely the opposite. He begins on a mixture too strong and after weeks of indigestion gradually works down to the point of tolerance. He is afraid to dilute the milk sufficiently at the outset.

In the modifying of all ordinary milk, it does not matter whether it is rich or poor, for cow's milk from the same source does not often vary more than does breast milk. The ordinary infant readily tolerates some variation in both breast milk and cow's milk. If we begin with a weak preparation we find what the child can take—and that is successful feeding. We reach that practical result whether the milk be high or low in fat and proteid. We give the child what it can digest and thrive on. We may do this without regard to percentages, though it is better to know as nearly as possible what the strength of each mixture is.

The following table will explain more clearly the statements regarding the proportion of fat and proteids in the upper nine or fifteen ounces of milk and cream. I am well aware that some recent experiments have shown a lower percentage in the seven-ounce cream. Below that, however, all chemists give virtually the same results. It is rare in actual practice that cream stronger than fourteen per cent. is required.

The table is based upon milk containing 4 per cent. each of fat and proteid.

TABLE I.

	7 ounces	top milk	contain	16	per cent.	fat,	4	per cent.	proteid
8	"	"	"	14	"	"	4	"	"
9	"	"	"	12	"	"	4	"	"
11	"	"	"	10	"	"	4	"	"
15	"	"	"	8	"	"	4	"	"
20	"	"	"	6	"	"	4	"	"

These top milks simply require diluting three to ten times. When the milk is to be well diluted, the top 9 ounces are commonly required; as the dilution is reduced, 12 or 15 ounces.

For example, dilute nine-ounce top milk to one-fourth and we have 3 per cent. fat and 1 per cent. proteid. Dilute fifteen-ounce milk to one-half and we have 4 per cent. fat and 2 per cent. proteid. For a young infant, dilute nine-ounce top milk eight times and we have 1.5 per cent. fat and .5 per cent. proteid. With the same dilution, if we take off two ounces less (seven-ounce top milk), we have 2 per cent. fat and the same proteid. Take two ounces more (eleven-ounce top milk) and we have 1.25 per cent. fat and the same proteid. We thus regulate the proteid by diluting; the fat, by the amount taken from the top.

Simply divide the figures of this table by the number of times the milk is diluted and the percentages of fat and proteid in the mixture are known. The claim is not made that this will result in the same absolute percentages with every milk. No modification can possibly do that, unless the quality of the milk is known. It will, however, be as accurate as any other method of home modification and will be sufficiently close

for ordinary cases. Systems of formulas based upon average milk are certain to fail in many cases because all milk is not average. While it is desirable that the practitioner should know just what percentage the infant is getting, he can prescribe satisfactorily if he will but begin low and work up slowly by taking gradually less from the top of the milk or diluting it less, thus changing the fat or proteid as he desires.

If the whole amount of top milk is not required, it should still be dipped off. The portion not required may be returned to the bottle. For example, if the child is to have 24 ounces of food, of which one-fourth is to be nine-ounce top milk, we use 6 ounces of the latter and return 3 to the bottle. This point must be carefully explained to the mother, or she may take off but the six ounces required, thus increasing the amount of fat by 50 per cent.

The Sugar.—Having obtained the requisite percentage of fat and proteid, we must add sugar. The accuracy of the following figures is evident at a glance:

TABLE II.

1 part sugar to 20 parts food adds 5 per cent.					
1	"	"	25.	"	4
1	"	"	33	"	3
1	"	"	50	"	2

This renders the problem very easy, but still easier is the fact, recently pointed out by Holt, that for mixtures below 2 per cent. of proteids (those less than half milk) one ounce of sugar to 20 ounces of mixture, with the sugar already in the milk, will give a total of from 6 to 7 per cent. of sugar. These are the percentages required in almost every formula for the first ten months.

An ounce measure will hold two-thirds of one ounce of milk sugar by weight. If measured by a tablespoon, two level tablespoonfuls of granulated sugar or almost three tablespoonfuls of milk sugar equal one ounce. Milk sugar should be used when possible. When cane sugar is used, the percentage should not be as great as for milk sugar, for the child does not usually digest it as well.

Diluent.—Three forms of diluent are in common use, boiled water, plain gruel, and digested gruel. There has been more discussion on the subject of diluents during the past two years than upon any other question in infant feeding. Some strongly oppose the use of anything but water, using chiefly the argument that in employing a gruel, we are introducing an element into the food not found in breast milk. This argument loses its force when we remember that in the nitrogenous elements of cow's milk we have substances not found in breast milk. The decision should be based upon experience rather than upon theory. If gruels aid in digesting the proteids of cow's milk, no theory should be allowed to prevent their use. My personal experience is that many children do perfectly well with water as a diluent, while others digest better when a

predigested cereal is added. Digested gruels are certainly more effective than plain gruels. They are certainly now used much more largely than they were a few years ago by nearly all leading pediatric practitioners. These gruels are made from oatmeal, rice, barley, or wheat flour. A heaping tablespoonful is made into a gruel with a pint of water by boiling for fifteen minutes. The gruel is allowed to cool to about 130° F., when a teaspoonful of Cereo is added, which converts the starch into absorbable dextrin and maltose. Sometimes one cereal agrees with an infant better than another. The object of the digested gruels is not so much to add nutriment to the food as to render the caseine more digestible.

Percentage Feeding.—By this term we mean nothing more in ordinary food prescribing than a method of measuring the strength of our mixtures. In laboratory feeding alone, do we write our prescription in percentages. In home modifying we write our prescription as a formula, but we do not know what we are giving unless we know its percentage strength. It is the only means of accuracy. Still percentage feeding has been made an unnecessary bugbear to most physicians who regard it as an intricate and cumbersome contrivance.

By the method of modifying just described, we can readily obtain any percentages, if we wish to begin with a percentage prescription. As the ordinary range of top milk required is between 8 per cent. and 12 per cent., we can take three items from the table already given as a working table, as follows:

TABLE III.

9 ounces top milk,	12 per cent. fat,	4 per cent. proteid.
11	"	"
15	"	"

These few numbers are all that are necessary to enable one to obtain a given strength of milk. The one source of error is the varying strength of different milks and that applies to every method of home modification when we try to make a mixture that will contain definite percentages.

Suppose we wish to make a mixture containing fat, sugar and proteids in the proportion of 4, 7, 2. To get 2 per cent. of proteid, we must divide the 4 per cent. proteid of top-milk by two. We then require a top milk containing twice the amount of fat desired, or 8 per cent. This we obtain by taking fifteen-ounce top milk and diluting it to one-half. That is, we divide the proteid by two and multiply the fat by the same number. Suppose we wish a mixture of 2, 6, 0.8. To obtain 0.8 per cent. of proteid from 4.0 per cent., we divide by five and must, therefore, take a top milk containing the fat five times as strong, or 10 per cent. Take, therefore, eleven-ounce top milk and dilute it to one-fifth. The sugar in each case should be one ounce to 20 ounces of the mixture.

I have purposely refrained from giving formulas. They are a detriment and a drawback to the practitioner and serve no useful purpose in

ordinary home prescribing. They are useful for reference in cases of difficult feeding and may be found in abundance in the text-books of Rotch and Holt. For ordinary practice a less cumbersome method is necessary.

Character of the Food Required.—The policy of beginning feeding with a weak mixture should not be misinterpreted. The infant should not be kept on such a diet. The strength should always be slowly but steadily increased. On the second day of life an infant can usually take nine-ounce top milk diluted eight times, to be increased after the fourth day. For an older child nine-ounce top milk may be diluted from five to seven times at the outset. One important fact has been demonstrated by experience—few children under six months can take cow's milk in the strength of average breast milk.

Having found a satisfactory food, it is not advisable to change upon slight provocation or to try to meet every little symptom by changing the formula. If the child becomes acutely ill it is best to dilute, so as to reduce all the elements. If the illness is indigestion or diarrhea, stop milk at once and completely. Roast beef is an excellent article of diet for healthy adults, but very inappropriate when they are suffering from vomiting or diarrhea.

Summer diarrhea should not be considered a simple indigestion, but a poisoning by bacteria which thrive particularly well in milk. Even in simple indigestion, it usually saves time and trouble to stop the milk for a few feedings and give broth or digested gruel, just as one would stop the ordinary diet of an adult. Restlessness at night is commonly due to indigestion, and may frequently be cured by making the last feeding of digested gruel.

Chronic indigestion, with beaded ribs and sweating of the head in sleep, suggests rickets and indicates more fat and perhaps proteid.

Painful joints and purple gums suggest scurvy and indicate a diet of fresh, unheated milk with, perhaps, beef-juice and orange-juice. Eczema in young babies is sometimes relieved by reducing the fat. Constipation with hard, dry stools may sometimes be relieved by increasing the fat, but caution should be used against increasing it excessively. Colic, flatulence, and restlessness are an indication for the reduction of the percentage of proteids.

Regurgitation of the food with perhaps small frequent passages, suggests excessive fat and indicate its reduction. Green, acid stools, with perhaps gas and colic, suggest an excess of sugar. Curdy stools call for more dilution of the top milk. Foul stools call for bowel washing and reduction or stopping of the milk.

It is rare that symptoms of indigestion can be completely relieved by reducing any single element. It is usually best to reduce all for a time and slowly work up using particular care with reference to the element that is apparently the offender.

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STUDIES IN THE BACTERIOLOGY OF TYPHOID FEVER, WITH SPECIAL REFERENCE TO ITS PATHOLOGY, DIAGNOSIS AND HYGIENE.

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THE discovery and interpretation of the exact bacteriological conditions and pathological lesions existing in the various stages of typhoid fever have for years occupied the attention of investigators. Patient observation and careful experimentation have brought much to light in regard to these conditions and lesions. Nevertheless, in the case probably of no other disease, the inciting organism of which has been so definitely determined and thoroughly studied in pure culture, has so much of the experimental work proved unsatisfactory and interpretation been so hampered by untrustworthy data.

This, I take it, has depended largely upon two sets of conditions underlying these investigations and experiments; in the first place upon the slight susceptibility of the usual test animals to a true typhoid infection, the levity of the lesions induced by such infection or intoxication, and the lack of conformity between the disease process in these animals and that occurring in man, having of necessity left much in doubt and permitted of different interpretations.

In the second place this has depended upon the close similarity of the colonies of the typhoid bacillus to those of the various bacilli belonging to the so-called colon group when these bacilli are grown upon nutrient pepton-gelatin and pepton-agar. That these media should have been those in universal use as separating and isolating media must, as far as the bacteriology of typhoid fever is concerned, be looked upon as unfortunate, since it not only placed an almost insuperable barrier in the way of recognizing typhoid colonies in the presence of those of colon bacilli, but at the same time brought into undue prominence practically the sole important characters which typhoid and colon bacilli have in common.

The similarity of colony characters and the occurrence of colon bacilli normally in the intestinal tract, and at times in various organs after death, so that typhoid and colon colonies often appear in company in the isolating media, have given rise to endless confusion in the bacteriology and interpretation of typhoid fever. Further than this, upon these points—the similarity of colony appearances and the identity of place of occurrence—have been largely based the idea of the close relationship and even interchangeability of these probably phylogenetically connected, though really very distinct and easily differentiated forms—a relationship which would undoubtedly have been long in suggesting itself had some other medium been at the command of those investi-

gating the subject, or had the colon bacillus not been a regular dweller in the intestine.

The object of the present paper, therefore, is to pass in review the bacteriological investigations of typhoid fever which have been based on a fuller knowledge of the bacillus, and to see what bearing the results of these investigations may have on our interpretation of the disease process in man, and for what aid in diagnosis we may legitimately turn to bacteriology and what assistance hope for in determining rational hygienic measures for limiting the spread of the disease.

The history of the typhoid bacillus from the moment of its ingestion to its appearance in various regions and organs of the body still presents many gaps and on many points we cannot yet speak authoritatively, hence conclusions which may be drawn in this paper are in many instances tentative and are here simply set forth as the most probable in the light of present statistics and with the desire to focus attention upon and incite further investigation on mooted points.

A detailed résumé of the various investigations which have been carried on since Eberth's¹ discovery in 1880 of the typhoid bacillus in the tissues of those dead of typhoid fever, and Gaffky's² communication in 1884 in regard to the isolation of this bacillus in pure culture on artificial media, would be beyond the limits of this paper, but a few words on etiology may be of value, since the etiological relationship of this bacillus to the disease is in some of its phases particularly difficult of demonstration. This, as has been said, is especially true of animal experimentation, for although the typhoid bacillus and its products when introduced intravenously, subcutaneously, or intraperitoneally, do bring about the more or less rapid death of certain animals, still it has been observed that it is practically impossible by such means to induce the characteristic intestinal tissue reactions and lesions. Some observers even have held that a true infection, implying a multiplication of the organisms within the animal body, does not take place, and that the animals simply succumb to an acute intoxication due to the absorption of the already manufactured toxins and products introduced with the bacilli, and to the poisons liberated from the bodies of the bacilli, as they die and disintegrate within the inoculated animal.

It is generally true that death from such inoculations takes place in most animals within a limited number of hours, or not at all, and if a true infection does occur its rapidly fatal termination practically precludes the appearance of such characteristic and advanced pathological changes as those induced in man by the presence of this organism. Notwithstanding these facts, an infection giving rise to some of the more typical lesions, it seems, may at times be induced by the usual means or may

be brought about with greater regularity by various methods which are used either to raise the virulence of the organism experimented with, or to reduce the insusceptibility and resistance of the animals inoculated. Sanarelli,³ who has contributed to the knowledge of the action of this organism and its poisons on the animal economy and in regard to the distribution of bacilli within the animal body, considers that under proper conditions a true infection takes place and that the sites and character of the lesions induced, either by a true infection or the introduction of the products of the macerated organisms, are in many points peculiar to the infection or poisoning, and have a close similarity to those incited in man; close enough in fact to form a strong link in the proof of the etiological relationship of this bacillus to typhoid fever.

From time to time, cases have been reported of typical intestinal ulceration following inoculations of typhoid bacilli in animals, and lately Remlinger⁴ seems to have had little difficulty not only in inducing these typical lesions in the intestines of rats and rabbits, but in bringing about infection by ingestion. Rare cases of infection by ingestion or by the intestinal tract have been reported, but special means have been used to destroy the action of the acid of the stomach, or to introduce the bacilli into the intestine. Ordinary feeding with infected food has heretofore proved ineffectual, and Remlinger's success not only in this line, but in the observation of typical lesions, is to say the least exceptional, and probably will be hesitatingly accepted unless further experimental confirmation is given it.

The demonstration of these rarer and more characteristic pathological lesions in animals, taken in connection with Pfeiffer's discovery of the action of special bactericidal substances—the so-called bacteriolytic or lysogenic substances—which develop in the blood of typhoid-fever patients and of animals undergoing immunization, and in connection with the recognition by various observers of other characteristic changes in the blood of typhoid patients and animals, changes supposedly due to the development of substances known as paralytins and agglutinins, which give rise to the phenomena now so familiar to us as constituting the Widal serum reaction, places the relation of the bacillus to the disease on a more scientific basis, although the constant presence of this organism in the organs of typhoid cadavers and its frequent isolation from the blood and spleen, as well as from the feces and urine of typhoid-fever patients during life, render these further proofs almost unnecessary.

The greatest and real obstacle, however, to a true appreciation and comprehension of the typhoid process in man, lay not so much in the question of the pathogenicity or non-pathogenicity of the typhoid bacillus for animals.

and the failure of the typical disease process to unfold itself in them, as in the difficulties encountered in the isolation and identification of the typhoid bacillus in the presence of other forms of bacteria. This, as has been previously suggested, and as we shall see in considering the question more closely, has given rise to various conceptions of the disease process and in regard to the localizations of the bacilli in the body.

Until about 1890, the characters of growth and the chemical reactions depended upon to differentiate typhoid bacilli from various members of the so-called colon group of bacilli were too few and ill defined for complete confidence to be placed in statistics based upon them. It was only with the application of methods bringing to light the more obscure physiological activities of the typhoid and colon bacilli—especially the results of their life processes in the presence of the various sugars, and the changes brought about in media containing pepton, *i.e.*, indol production—that statistics relating to the isolation of typhoid bacilli from various sources could be used with confidence. The confusion existing in regard to the typhoid and colon bacilli, which was primarily due to the close resemblance of their colonies on the ordinary isolating media, led, before the recognition of the colon bacillus by Escherich,⁵ to the general belief that the typhoid bacillus occurred in great numbers in the intestinal contents, and to the conception of the disease as a more or less pure intoxication, in which the bacterial products were to a large extent manufactured by these organisms in the intestinal lumen, and from there absorbed, thus giving rise to the symptoms and lesion characteristic of typhoid fever, with a later local invasion of the lymphatic tissues and patches of Peyer by the bacilli. After Escherich's discovery and the consequent evolution of the more definite tests for the recognition of these bacilli in pure culture, it was found to be possible only rarely and with difficulty to isolate the typhoid organism from the intestinal contents. As an instance of this we may mention that, even as late as 1895, we find Wathelet⁶ investigating stools by plating out in ordinary nutrient gelatin and recording very discouraging results, only ten colonies out of the six hundred tested proving to be those of typhoid bacilli. This experience is typical of that of many other investigators, who have interested themselves in the isolation of typhoid bacilli from intestinal contents and from the organs of those dead of typhoid fever. Such failures as these lent support to the opinion that the inciting organisms were not, at least as a rule, to be found in the feces, and to such statements as that of Silvestrini⁷ that the tumefaction of the patches of Peyer ought not to be looked upon as due to a primitive localization of the virus, but as a local ex-

pression of a general process. Sanarelli,⁸ like Silvestrini, laboring under this misconception in regard to the presence of the bacilli in the feces, believed the lesions to be due to the toxins formed at other places in the body by the bacilli, these bacilli thriving best in the lymphatic system and there producing toxins which besides causing phenomena common to many other poisons, induce lesions characteristic of typhoid fever; and further, he considered that in experimental typhoid fever and, as he thought, in the typhoid fever of man, the intestinal lesions were induced exclusively by toxins produced elsewhere in the system, and that this alleged fact took away all value from the old idea according to which typhoid fever should be considered as an infectious process of intestinal origin with localizations in the intestines.

The conclusions of these and other observers, reached in regard to the essentially general character of the typhoid infection, in contradistinction to an intestinal intoxication, or even an infection with its seat solely in the intestinal lymphatic tissues, should, as we shall see, be looked upon as substantially correct, although recent methods for isolating typhoid bacilli have enabled us to demonstrate that these investigators were distinctly wrong in supposing that typhoid bacilli occurred only rarely or not at all in the intestinal contents of typhoid fever patients.

How far the statistics at our command coincide with these views and are suggestive of the seats of election or rather existence of the organisms in the body will be briefly considered later under various headings.

The questions which will be taken up primarily are those relating to the possibility of isolating the bacillus from various situations during the disease, and the diagnostic value of such isolations to the clinician, and also the hygienic as well as clinical question of the usual time of appearance and disappearance of the organisms from the intestinal contents and urine.

In the various bacteriological studies of typhoid fever for diagnostic purposes attempts have been made during the life of patients to isolate the bacilli by spleen puncture and from the blood, rose-spots, sweat, urine, feces, and throat and mouth secretions and exudates. The principal results of these investigations it may be profitable to consider in some detail.

Spleen Puncture.—Typhoid bacilli have been frequently isolated from the spleen by puncture during life. The usual time of their first appearance in this organ cannot be determined from present statistics. That they are very constantly present in the spleen during some period of the disease does not admit of doubt, but whether they arrive there practically at the inception of the disease and whether the spleen then acts as a safe place of abode and

multiplication have not been proven. Isolations from about the seventh or eighth day on do not seem to be uncommon.

The scientific evidence to be obtained of the distribution of typhoid bacilli throughout the system, especially of the usual time of arrival of the bacilli in the spleen, as well as the value of the results from a diagnostic standpoint, makes spleen puncture a very tempting procedure to the pathologist and bacteriologist as well as to the clinician; yet, as a means of diagnosis and investigation, it is not to be encouraged on account of the grave consequences to the patient which its employment sometimes entails.

Blood and Rose-Spots.—The earlier examinations of the blood and rose-spots of typhoid patients proved in the main unsatisfactory, though in spite of many failures, some of the investigations gave a certain proportion of positive results. In 1895, Thiemach⁹ investigated seven cases with the recovery of the bacilli in four of them, three from the rose-spots and one from venous blood. In plates made from these blood specimens the number of colonies was very small, never more than two or three developing. With Besson¹⁰ the drawn blood from nineteen cases gave no organisms and the result of the investigation of fifty-four rose-spots from nineteen patients showed fifty-three negative and only one positive result. Scottmüller¹¹ examined the blood from fifty patients, and obtained typhoid bacilli from forty of them. He made plates with about 4 c.c. of the blood mixed with agar. The colonies, by this method, were few in number and very tardy in development. Castellani¹² used large quantities of bouillon, which he inoculated with 10-40 drops of the blood to be examined. By doing this the blood was highly diluted and its germicidal action weakened. Fourteen cases were examined with twelve positive results. Auerbach and Unger, using practically the same technic, took blood aseptically from the median vein, and added 10, 20 and 30 drops to 300 c.c. of bouillon in Erlenmeyer flasks, which were then well shaken. They thus demonstrated bacilli in the blood of seven out of ten patients. Of the seven positive cases only one ran a severe course and terminated fatally. The remainder were either light or of medium severity. The bacilli were present in three cases on the twelfth day, in one on the sixteenth, and in one on the twenty-second. In two cases, during relapses with the development of rose-spots, they were found on the twenty-ninth and forty-second day respectively.

Neufeld¹³, in 1899, believing that the failure of the investigations of rose-spots was due to the germicidal action of the blood accompanying the bacilli from the spots, instituted a procedure in which this blood was immediately diluted by its addition to nutrient broth. This method appeared to be eminently successful since

he was enabled to cultivate the organisms from thirteen out of fourteen patients thus examined. Curschmann¹⁴, subsequently following the same method, obtained the organism from fourteen out of twenty patients, and in none were more than two spots incised. Richardson¹⁵, of Boston, with a slight modification of Neufeld's method, has been successful in the isolation of typhoid bacilli from five out of six patients. In his procedure, after a preliminary washing with alcohol and ether, the rose-spots are frozen by a spray of ethyl chloride. This not only makes the operation painless, but drives the blood out of the skin and away from the vicinity of the spot. A small incision is made over the spot and some of its contents curetted out with a very fine skin curette and transferred to a tube of nutrient broth, and finally the blood collecting as the effects of freezing wear off is transferred to broth.

These researches show that the organism may be obtained in this way as early as the seventh and eighth days, and apparently generally several days before the outspoken development of the substances in the blood which give rise to the Widal reaction. Unfortunately, for the general use of these procedures, five or six spots, it seems, should be examined in each case to insure success, and the curetting of spots is an operation which will undoubtedly be submitted to with much hesitation by the majority of patients.

Mouth and Throat.—Besson¹⁶ has called attention to the examination of the products of inflammation from the throats and especially the tonsils of patients suffering with typhoid fever, and reports the recovery of typhoid bacilli from the tonsils of six out of ten cases investigated; he lays stress on a fact, most obvious from his results, that the expectoration of such patients may contain the specific organism and ought to be carefully disinfected. Comparatively little attention has been paid to the bacteriologic examination of mouth and throat secretions in typhoid, but such results make these investigations seem very advisable from both a diagnostic and hygienic standpoint.

Urine.—The examination of the urine of typhoid patients has heretofore given a greater number of positive results than the blood and the percentage of these results has not become lower as the methods used for the recognition of typhoid bacilli have grown more exact and refined. Neumann¹⁷ discovered the bacilli in eleven out of forty-six cases and Karlinski¹⁸ in twenty-one out of forty-four cases. Seitz, Konjajeff, and Silvestrini, also record positive results. In 1895, Wright and Semple¹⁹ reported six positive cases out of seven. Besson, writing in 1897, analyzed thirty-three cases examined by him. All of his specimens of urine were carefully tested to determine the presence or absence of albumin and the proportion in which it occurred. The urine from nine patients did not show albumin, nor

were typhoid bacilli isolated from these specimens. Twelve of the patients gave albumin in traces and always in amounts less than 1 gm. per 1,000 c.c. Among these latter only one gave a positive result. The urine from the remaining twelve patients contained albumin in large amount, 1 gm. or more per 1,000 c.c., and five of the cases showed typhoid bacilli. From his researches, Besson concluded that the bacillus of Eberth appears in the urine only when it contains albumin, and especially in quantities equal to or above 1 gm. per liter, and that the bacilli disappear from the urine at the same time that the albumin disappears. Karlinski also noted the relation existing between the occurrence of the bacilli and the presence of albumin.

The researches of Petruschky,³⁰ Richardson,³¹ and Horton-Smith³² indicate that the bacilli do not appear in the urine before about the fifteenth day of the disease or even later in the febrile period and at times not until convalescence is established. From the fifteenth day on, general statistics show that the bacilli may be isolated from about 25 per cent. of the cases. The organisms according to most observers may persist in the urine for days, weeks, and in rarer cases it has been claimed for months. Albumin is generally present in these urines, but, it seems, may in rare instances be absent; on the other hand, urine may contain albumin but no bacilli.

My own results present a fair agreement with these conclusions. Seventy-five supposedly true cases of typhoid fever* examined before the fourteenth day did not once yield typhoid bacilli in the urine.

Another special series of fifty-four patients (104 specimens of urine) examined in the later stages of the disease, from the twenty-second day to the tenth week, show the presence of the bacilli in seven.† In these fifty-four patients the temperature was reported to have reached normal and convalescence was established. The results of the examinations of the seven positive cases, being of special interest, are here recorded.

Case III.—Urine examined on the twenty-fourth and thirty-third day. Bacilli isolated from both specimens and albumin found to be present.

Case V.—Examined once in fifth week; bacilli present, also albumin.

Case XVI.—Examined once, on thirty-sixth day; albumin could not be determined.

Case XIX.—Reported as in the sixth week. October 13th, urine did not contain bacilli. Albumin $\frac{1}{4}$ gm. to 1,000 c.c. On October 18th, 19th, 25th, and November 1st, bacilli were present. Albumin had disappeared on November 1st and the bacilli were not found on November 7th, 14th, 16th, 22d, or December 1st.

Case XXXVII.—Bacilli were present in the urine, but no albumin, at time of the first exam-

ination, October 25th (fifth week). On November 4th, no albumin was present and no bacilli, and again on November 9th and 17th neither bacilli nor albumin could be demonstrated.

Case XLV.—Exact day not recorded, but case convalescent. November 19th, bacilli and albumin present; December 3d, no bacilli and no albumin.

Case LIV.—Seven and one-half weeks. Convalescent. Pus in urine, and organisms exceedingly numerous. Urine not further examined. Patient later developed periosteal abscesses.

The examination of these fifty-four patients seems to indicate that possibly twelve or more per cent. of cases in which the temperature has touched normal may be looked upon as containing typhoid bacilli in the urine, and the histories indicate strongly that the bacilli tend to disappear as the albumin vanishes. This vanishing with the albumin may be more frequent in post-febrile stages at which time the supply of bacilli from the general system to the kidneys and bladder has presumably ceased, and the bacilli not being supplied with suitable nutriment in the urine cease to multiply and are eliminated from the bladder.

The investigation of the urine, in the light of the foregoing conclusions, is seen to be of more value from the hygienic standpoint than from that of diagnosis. Except in persistently obscure cases when later examinations may be useful, the examination of the urine for purposes of diagnosis is apt to be futile, on account of the usual late appearance of the organisms in this excretion.

Feces.—As I have previously indicated, the problem of isolating the typhoid bacilli from the stools of typhoid patients had, up to the time of the introduction by Elsner³³ of his modification of Holz's acid-potato-medium,³⁴ remained to such an extent unsolved, that Nicolle³⁵ even went so far as to remark that not only in water, but also in the stools, and even in the parenchyma of the spleen, the presence of the bacterium coli constitutes an insurmountable obstacle to the isolation of the typhoid bacilli. Although this was hardly a fair statement of the case, yet taken in connection with such experiences as those of Wathelet, previously noted, it gives some idea of the difficulty of recognizing the colonies of bacillus typhosus in the usual gelatin plates, when these colonies are surrounded by those of the constant inhabitants of the digestive tract—the members of the colon group of bacilli. This is not the only difficulty attending the use of ordinary gelatin, for organisms at times occurring in the plates possess the power of liquefying the gelatin, before a typical development of the typhoid colonies can take place. By Elsner's method, in which a potato-extract gelatin medium plus 1 per cent. potassium iodide is used, these liquefying species are to a great extent ruled out, and in the majority of cases the colon bacilli and typhoid organisms alone develop. By this method the typhoid colonies according to most observers may be recognized in from forty-eight to seventy-

* Some of these cases may not have been typhoid-fever cases. Exact data could not be obtained in all instances.

† I am indebted to Dr. Edmund Le Roy Dow for valuable assistance in procuring many of these specimens, and for the albumin determinations.

two hours, being much smaller and lighter in color than those of the colon bacilli. This medium, not only in the hands of Elsner, but also when applied by Brieger, Lazarus, Chantemesse, and others in Europe, and by Richardson in this country, has given very satisfactory evidence of its usefulness. By this method of Elsner, Brieger²⁶ investigated the stools from eleven patients with typhoid during the various stages of the disease and claimed positive results in all the cases in the febrile stage. Examinations made just at the time of the disappearance of the fever and during convalescence gave uniformly negative results, with the exception of two cases in which a relapse occurred, and in one case complicated by venous thrombosis. Lazarus,²⁷ by Elsner's method, examined the feces of twenty-one patients, five in the febrile stage, and sixteen convalescent, free from fever for a longer or shorter time. In the febrile cases from the first to the third week he repeatedly found the bacilli. In cases convalescent, three days to six weeks, only three were shown to contain bacilli. One, it is thought, gave the bacilli on the forty-first day of convalescence. Chantemesse,²⁸ likewise, examined by the same method the stools of sixteen patients who were suffering from or had had typhoid fever. Three times the examination was negative; once in the case of a young patient three weeks convalescent, and with two others in the febrile stage. His other cases he claims gave positive results as early as the seventh and as late as the twenty-sixth day. Chantemesse considered the slowness of the development of the typhoid colonies a serious inconvenience in the method of Elsner, so valuable in other respects, and expressed the hope that a perfecting of the method would render it more available for purely clinical purposes.

In April, 1896, investigations were commenced by me on the behavior of various bacteria in semi-solid culture media. These media gave such promise of being useful in the differentiation of closely allied forms of bacteria that the study of bacillus typhosus and the various members of the colon group of bacilli was undertaken because of the interest and practical value connected with the differentiation of these organisms. These investigations are elsewhere recorded in detail (*Journal of Experimental Medicine*, 1897, Vol. II., No. 6, p. 677) so that I now only call attention to the composition of the media resulting from the experiments, and to the results of the practical application of the media to the isolation of the typhoid bacilli from the stools of typhoid patients. Two media are used—one for the differentiation of the colonies of typhoid bacilli from those of the colon group by plate culture, and one for the differentiation of these forms in pure culture in tubes.

The plating medium is composed of 10 gm. of agar; 25 gm. of gelatin; 5 gm. of sodium chloride; 5 gm. of Liebig's extract of beef; 10 gm. of glucose, and 1,000 c.c. of distilled water. The final titration of this medium should indicate the

presence of 2 per cent. of normal acid,* phenolphthalein being the indicator, and the medium should be brought to this acidity by the addition of normal hydrochloric acid solution.

The growth of the typhoid bacilli in plates made from this medium gives rise to small light greenish colonies with irregular outgrowths and fringing threads. The colon colonies on the other hand are much larger, and, as a rule, are darker and do not form threads. This medium is practically solid and the differentiation seems to depend upon the fact that typhoid bacilli form threads in a medium of this acidity when pepton is absent.

The tube medium contains agar, 5 gm.; gelatin, 80 gm.; sodium chloride, 5 gm.; Liebig's extract of beef, 5 gm.; glucose, 10 gm.; distilled water, 1,000 c.c., and should react 1.5 per cent. acid, phenolphthalein being the indicator.

In this semi-solid medium the growth of the typhoid bacillus produces uniform turbidity, at 37° C. within eighteen hours. The colon cultures do not give the uniform clouding and present several appearances, dependent upon differences in the degree of their motility, and upon their power to produce gas in the medium.

The usual method of making the test is to take enough of the specimen of feces, i.e., from one to several loopfuls, and transfer it to a tube containing broth, making the broth fairly cloudy. From this emulsion five or six plates are usually made by transferring one to five loopfuls of the emulsion to tubes containing the melted plate medium, and then pouring the contents of these tubes into Petri dishes. These dishes, after the medium has hardened, are placed in an incubator at 37° C. and allowed to remain for eighteen to twenty-four hours, when they are ready for examination. If typical colonies with fringing threads and outgrowths are found, the tube medium is inoculated from them and placed in the incubator at 37° C. for eighteen hours. If these tubes then present the characteristic clouding, our experience indicates that the diagnosis of typhoid may safely be made, *for the bacillus of typhoid alone, of all organisms occurring in feces investigated during these experiments, has displayed the power of giving rise both to colonies with fringing threads in the plating medium and the uniform clouding in the tube medium when exposed to a temperature of 37° C.*

A diagnosis may thus be made in from thirty-six to forty-eight hours. If doubt is entertained as to the distinctiveness or value of these characters, the bacilli may be further tested against a dilution of a known typhoid serum.

The organisms isolated in this manner have been subjected to the usual tests for the recognition of typhoid bacilli in pure culture, and have always corresponded in their reactions to those given by the typical bacillus typhosus.

By this method, since June, 1897, some three hundred and twenty-three cases, represented by

* Experience has shown that a final reaction of 1.8 per cent. acid is to be preferred, when attempting to isolate typhoid bacilli from feces.

over four hundred stools, have been investigated. Many of these specimens sent by practitioners to the laboratory represented cases in which an early clinical diagnosis could not be made, and which cases were eventually diagnosed as other affections. Of the three hundred and twenty-three cases, one hundred and eighteen may be considered positively as cases of typhoid fever. Typhoid bacilli were isolated from the stools of forty-five of these cases and their presence could not be determined in seventy-three cases. Among the seventy-three cases giving no typhoid bacilli are to be found ten convalescents, in the feces from which we would not expect to obtain the organisms, and which may therefore legitimately be subtracted in estimating the percentage in these cases. We have, then, practically a series of one hundred and eight cases represented by forty-five positive and sixty-three negative findings, or a positive percentage of nearly forty-two. This percentage must be considered very encouraging considering the unfavorable conditions under which some of this work was carried on.* It is worthy of note, in connection with what will be said later, that at least one-half of the negative results here recorded were represented by specimens of feces taken very early in the disease.

The most interesting results, and those which give a fairer idea of what may be hoped for in carefully investigated cases, were obtained in the examination of stools from typhoid-fever patients of the New York Hospital.†

This series consisted of twenty-six cases of typhoid fever, twenty-one in the febrile stage and five convalescent. Of the febrile cases nineteen were thoroughly investigated and in the feces of seventeen of these typhoid bacilli were demonstrated, and often in great number. Thus of these nineteen cases we find 89.5 per cent. giving positive results. In the other two cases of the febrile series the plates were not satisfactory, and only one specimen from each was examined, both of the patients dying very early; yet including these cases the statistics still show that over 80 per cent. of the febrile cases gave the typhoid organisms. The bacilli were isolated from these cases as early as the sixth day and as late as the thirtieth day, and in a case of suffering from relapse on the forty-seventh day of the disease and nineteenth day of the relapse.

The convalescent cases gave uniformly negative results, the earliest examination having been made on the third day after the disappearance of

the fever. The bacilli occurred most regularly in the stools from about the tenth or twelfth day. This was especially well shown by one case examined every two days from the fourth day of the fever, no bacilli appearing until the twelfth day.

Among my cases there have been several in which no Widal reaction could be demonstrated but the feces contained typhoid bacilli and in one case the bacilli were found at the first trial on the tenth day of the disease, three examinations for the serum reaction having proved negative. In this case the specimen examined was not much more than a trace of the intestinal discharge, dried on a splinter of wood, this having been forwarded to me from a neighboring city. The colonies of typhoid bacilli developing in the plate were extremely numerous.*

The foregoing is a review of investigations and statistics from the more purely utilitarian standpoint of diagnosis, but we may now consider more particularly what these researches have brought to light in regard to the history and distribution of the bacilli in the human body, and in regard to their relation to the lesions of the disease.

Typhoid fever can no longer be looked upon, if in fact it really was ever so considered, as a simple toxemia, with the inciting organisms living, multiplying, and producing their toxins, solely in the lumen of the intestine during at least the major part of the disease, with a local invasion of the lymphatic tissues at the time of the appearance of the intestinal lesions, and a probable final general distribution of the invading organisms at the time of or just preceding death. It is now known that the bacilli are to be found in the blood, rose-spots, spleen and urine during the life of the patient, and this often at a fairly early day, and the growing tendency is to interpret the intestinal and other lesions rather as manifestations of the action of diffusible toxins and other products which are produced by the metabolism of the bacilli, or liberated from their degenerating and disintegrating bodies, within the body of the patient, and not of necessity absorbed from the lumen of the intestinal tract—that, in short, the infection is not comparable to cholera. From the standpoint of human pathology, in support of this

* These statistics were given in a paper entitled "Studies on the Isolation of *Bacillus Typhosus* as a Means of Diagnosis of Typhoid Fever," read before the Section on General Medicine, at the New York Academy of Medicine. This paper was not published, but a report of it appeared in the "Medical Record," December 11, 1907.

The following conclusions were at that time drawn:

1. The presence of the "specific" bacilli in the blood, spleen, rose-spots, and urine, and this often early in the disease, indicates that the bacilli occur more generally distributed throughout the body than was at first supposed, and, if we are warranted in drawing any conclusions on this point, the bacilli after their ingestion, seem to invade the system and increase there, not reappearing in the contents of the intestinal tract in great numbers; until probably the time of the breaking down of the intestinal lesions.

2. The stools of typhoid patients have been shown, through the methods at our command, to contain the bacilli in a large percentage of the cases, and throughout nearly the entire febrile period.

3. The tendency is for the bacilli to disappear rapidly with the fall of the fever, and in cases in which they do persist, there seems to be an especial liability to relapse.

4. Finally, compared with the Widal test as a means of diagnosis, the recovery of the bacilli may be assumed to positively demonstrate the infection, while the serum reaction may be absent or may indicate a past or present infection, and when present is even then not always to be relied upon as "specific."

* The majority of these specimens were met with in public diagnosis work carried on at the Research Laboratory of the Department of Health of New York. It was, of course, impossible to supervise the collecting of material from the patients, and it must be borne in mind in considering these statistics that, besides disinfected specimens (which are left out of the calculation), many of the other specimens were in what seemed very bad condition when received, often having been delayed several days in transit. With the exercise of due care on the part of the nurse in collecting specimens, and the immediate forwarding of these to the place of examination, much more favorable results may be looked for by those seeking this aid in diagnosis.

† Thanks to the constant courtesy of Dr. Samuel W. Lambert, Visiting Physician to the Hospital, and of Dr. Adrian V. S. Lambert, House Physician, specimens were taken under the most favorable conditions and sent to the laboratory without delay. I wish here to express my appreciation of their kindness, and the interest they have shown in forwarding these investigations.

view, it is to be noted that cases of typhoid fever in man are reported with no intestinal ulcers, and even without lesions, and the bacteriology of the feces also seem to indicate that these cases exist and are not extremely rare. The few cases of this description which have reached the autopsy-table also offer on their side an explanation of the absence of the bacilli from the feces of clinically typical cases, in which repeated examinations have been made and no bacilli found. That the presence of the bacilli in the lumen of the intestine is closely associated with the appearance of the lesions in the intestinal wall, and in all probability to a great extent dependent upon these lesions, rather than that the lesions are dependent upon the bacilli and their products in the lumen, seems to be indicated and borne out by statistics. In other words it appears probable that the lesions forms the chief source of supply of bacilli to the intestinal contents, the injured and necrotic tissues acting as a favorable place for multiplication.

In considering this question of the bacilli in the intestinal contents, we must remember that as yet we are ignorant of the mode and even of the exact place of entrance of the organisms into the system proper, *i.e.*, into the fluids and tissues of the body, although some part of the digestive tract may probably without error be looked upon as the usual site of the invasion. At what point of the digestive tract and how the bacilli gain entrance to the tissues is not known, but it may be granted that it is not at the same place and in the same manner in all cases, and this may account for the intestine showing a greater reaction in some cases than in others.

Whether a proliferation of the organisms in the intestinal contents in ordinary cases takes place previous to the true invasion of the system has never been determined; it would, however, seem to be otherwise, since a fairly consistent result of investigations is the failure to isolate the organisms from the feces during the first week of the fever.

Experiments *in vitro* bearing upon the behavior of typhoid bacilli in the presence of colon bacilli would also seem to support this contention, but unfortunately these results are not to be absolutely depended upon and in any case have not as direct a bearing upon the subject as may at first be supposed. It must not be forgotten that the feces are by no means of a definite composition and reaction, and the products of the metabolism of the various organisms found in them must of necessity vary in kind, strength, and effect on account of the variety of food furnished them and its initial reaction—for instance it is conceivable that typhoid and colon organisms could live together and multiply provided the percentage of acid produced could be kept below a certain point. Even if the body is not capable itself of bringing about this condition, an organism producing alkali in quantity by its life processes might be present and thus counteract the effect of acid production by other organisms. My

own experience and that of others indicates that the duration of life of typhoid bacilli in feces outside of the body is a very varying one, and even the power to multiply under these conditions cannot be denied, although it does not seem to be the rule.

However this may actually be, and notwithstanding the possibility of such a primary increase of the organisms in the lumen, still it does not seem logical to suppose that a pre-invasion multiplication is usual, and that the organisms then practically disappear from the feces just at a time when the body resistance is overcome, and actual infection permitted. Either a steady increase from the time of ingestion it seems will have to be postulated, or the bacilli looked upon as being derived from the lesions of the intestine. The latter view is supported by present statistics. A reiteration of the alleged fact that typhoid bacilli may be isolated with ease from the intestinal contents during the first and second week of the fever and that thereafter these organisms are not supplied to the feces, or are entirely overshadowed by the presence and action of the supposedly more virulent colon bacilli, is found in writings on this subject, especially in England. A careful consideration of statistics at our command leads us to other conclusions.

To bring out more strongly the result of investigations on this point, the course of the disease may be divided into three arbitrary periods: First to tenth day inclusive; eleventh to twentieth day inclusive; and twenty-first day to convalescence. An analysis of my series of cases shows the following:

First to tenth day inclusive, number of cases examined, 28; typhoid bacilli isolated, 3; typhoid bacilli not isolated, 25; percentage of positive cases, 10.7 per cent.

Eleventh to twentieth day inclusive, number of cases examined, 44; typhoid bacilli isolated, 22; typhoid bacilli not isolated, 22; percentage of positive cases, 50 per cent.

Twenty-first day to convalescence, number of cases examined, 16; typhoid bacilli isolated, 13; typhoid bacilli not isolated, 3; percentage of positive cases, 81.2 per cent.*

Considering these cases more in detail, we find: Of twenty-eight cases examined previous to the eleventh day of the disease, only three were found to contain typhoid bacilli in the feces, *i.e.*, 10.7 per cent. The earliest of these isolations I find reckoned as on the sixth day, but the history was indefinite and the day was probably later; the next earliest as on the ninth, and one as on the tenth day.

In the second period, eleventh to twentieth day inclusive, forty-four cases were examined and typhoid bacilli isolated from twenty-two, *i.e.*, from 50 per cent.; three on the eleventh day, five on the twelfth, two on the thirteenth, four on the fourteenth, two on the fifteenth, two on the seventeenth, one on the nineteenth, and one on the

* Urine may possibly have contaminated some of these specimens, but allowing the maximum urine isolation, 25 per cent., we still have 50 per cent. to be credited to the feces.

twentieth. The larger number of positive results given on the eleventh, twelfth, and fourteenth days is due to the greater number of cases examined on these days. It is worthy of remark that four cases were examined on the tenth day, three being negative. Three on the eleventh day all positive, and five on the twelfth all positive. Two cases were examined on the thirteenth and typhoid bacilli were found; on the fourteenth five specimens gave the typhoid bacilli in four.

Sixteen cases were examined in the third period, twenty-first day to convalescence, and typhoid bacilli isolated from thirteen of them, *i.e.*, 81.2 per cent. Four of the positive findings occurred on the twenty-first day and the latest on the thirty-second.

Considering some of the foregoing cases individually, specimens from which were examined in the first and second periods, we find results consistent with the evidence given by grouping the outcome of examinations of feces from various cases. Thus:

Case XIX., bacilli present on sixth day, also on twelfth.

Case XXII., no bacilli present on tenth day; present on twelfth.

Case XXIII., no bacilli present on fourth, sixth, eighth, tenth; present on twelfth.

Case LXI., no bacilli present seventh and tenth; present twentieth and twenty-second.

Our technical methods being under good control, and giving positive results from other feces at the same time that the examinations of the above specimens were made, it is not likely that typhoid bacilli occurring in four consecutive specimens, such as those from Case XXIII., which were most carefully collected, could have escaped detection and isolation, even granting that they were present in especially small numbers.

These statistics seem to be borne out by those of other observers. Karlinski²⁹ could not detect the bacilli before the ninth day, and his twenty-one cases gave two on the ninth day, two on the tenth, two on the twelfth, nine on the fourteenth, two on the seventeenth, and three on the twenty-first.

Wiltschour³⁰ could not determine their presence before the tenth day, and Redtenbacher³¹ in his review of statistics sums up by saying that in the majority of cases the bacilli first appear toward the end of the second week. Horton-Smith's³² cases show the bacilli absent or not detected on the eighth, thirteenth, and ninth, while the same cases gave the bacilli on the eleventh, seventeenth, and fourteenth, when the second examination was made. Richardson³³ notes a positive result on the fifth day, but considers that the disease was probably further advanced. In fact the majority of investigators do not even claim positive findings before the seventh or eighth day, and the vast majority of isolations occur from the eleventh or twelfth day on. On the other hand, Rémy,³⁴ one of the latest workers on this subject, claims isolations as early as the third, fourth, fifth, sixth, ninth, tenth, etc., days, but

declares, however, that it is difficult to determine the beginning of the disease, and that for ease of comparison he has always counted the day of the disease from the time when the patient took to bed. His positive results should therefore be reckoned as possibly occurring on days much later than the day indicated in his table. Rémy also attempted to estimate the number of colonies in plates to determine the relative proportion of the bacilli at various stages of the disease. His results seem to indicate that the bacilli, few in the early days of the disease, increase in numbers up to the second week (tenth day or later?) and then progressively diminish.

The conclusion which seems forced upon us by the results obtained in my own investigations and by those of others is that the bacilli do not occur in the feces, in numbers at least sufficient for recognition, much before the middle of the second week, or, in other words, about the time the intestinal lesions are well advanced and ulceration is occurring, and in the light of our present statistics on the subject (which may of course be modified by subsequent research) it seems most rational to look upon the presence of the organisms in the feces, especially in fair numbers, as indicating an ulcerating condition of the intestine, and that the organisms practically appear and disappear with these lesions—few when the lesions commence to break down, they increase as this process advances and commence to decrease as the ulcers begin to granulate and heal.

It must unhesitatingly be admitted, as noted previously, that there may be a period immediately following the ingestion of the bacilli during which it might be possible to isolate the organism from the intestinal contents, and it must not be overlooked that any condition giving rise to a serious discharge into the lumen might possibly bring about the presence of the organisms there before ulceration, even if infection had not had its immediate seat in the intestine; still as far as we have been able to determine, the organisms are absent during the early days of the disease, and do not appear in force until the time of severe intestinal involvement and ulceration.

Another hypothesis which may be offered in solution of this problem is that the organisms are continuously present in the lumen of the intestine from the day of ingestion, but, while overcoming the natural resistance of the body and while adapting themselves to a new environment, are unable to actually increase their numbers to any great extent, and are hence in such small force as to be detected with great infrequency. As the adaptation of the bacilli to their environment becomes more perfect and the resistance of the invaded organism is gradually overcome, conditions adverse to the bacilli are for a time overcome and they steadily increase and may then be detected with less and less difficulty. Although such may be the case, and undoubtedly these factors are to be reckoned with, this hypothesis, at present, does not seem to coincide with all the facts, such for instance as that of the apparent

continued absence of the bacilli from the stools of cases of the fever, which give all other clinical symptoms and tests, and which would probably be found to have little or no intestinal involvement or slight or few ulcers.

The gall-bladder, as is known, may contain the bacilli at some period of the disease, and must not be forgotten as a possible source of supply of the organisms to the intestinal contents. The bacilli from this source would, probably, under ordinary circumstances, appear not earlier than the second week, and whether they would survive to be discharged from the body has certainly as yet not been determined.

To what extent the presence and multiplication of the bacilli in the gall-bladder may affect the intestinal flora, we have no ready means of determining, and the problem must be solved by careful observation and analysis of intestinal and gall-bladder contents of cases dying without intestinal lesions or after the healing of these lesions. What these examinations will show cannot be foretold, but nevertheless it may be taken as generally true that the organisms of the disease tend to appear in the feces at a time corresponding to the breaking-down of the intestinal lesions, and to disappear gradually as those lesions granulate and heal, and finally generally vanish before the temperature reaches normal. We probably therefore have a fair index to the state of the intestine at any given time or in any given case in the occurrence and number of typhoid bacilli in the feces, although this may to some extent be influenced by the struggle going on among the intestinal organisms, or in the later stages by bacilli derived from the gall-bladder.

If we have interpreted our statistics correctly, as to the usual source of supply of typhoid bacilli to the feces, then the organisms must be present in the hyperplastic intestinal lesions, *i.e.*, the tumefied agminated and single follicles, and it is from these, at least during the height of the disease, that the bacilli are largely supplied to the intestinal contents, and I venture to conjecture that a marked tumefaction and ulceration of these structures in man do not occur unless the bacilli are present in them, that is, that they are not to any great extent dependent upon toxins, carried to these parts from a distance in the system, or absorbed from the intestinal lumen. This I am aware does not agree with some of the present conceptions of typhoid fever, which conceptions may be principally attributed to unsatisfactory technic and the results of animal experiments such as those reported by Sanarelli, who asserted that the presence of the bacilli of Eberth was in no wise necessary to the very characteristic and complex phenomena which develop in the intestine, and that the bacilli can act from afar in virtue of their poisons, while they themselves remain localized by preference in the serous membranes, as among the animals, or in the spleen, as in man. This may be perfectly true when lethal doses of the bacilli or their toxins are administered to animals, but we cannot argue from this that it is

necessarily true of the infection as it occurs in man, in whose case the primary dose of poison or bacilli is probably never very large, and the general poisoning often slight, the disease unfolding itself slowly.

It is well known that certain cells and tissues show a peculiar susceptibility to the action of certain poisons, while other cells and tissues remain unaffected or less affected in the presence of the same poisons. It is also true that the anatomical position of various cells, especially their proximity to the blood and lymph streams, renders them more liable to injury than cells not so situated when poisonous substances are present in the circulating fluids. Other cells, there is little doubt, may be especially exposed to toxic influences because they themselves, or the tissues of which they form part have some particular function of secretion, elimination or absorption. From these premises it may be logically argued that not only the less characteristic degenerations and lesions of a disease, but even focal and more pathognomonic lesions may be brought about by the simple presence of bacterial products in the fluids of the body. Experimentation has shown this in some instances to be the case. It does not necessarily follow, however, that all the lesions which characterize a given infection can be brought about by the simple introduction or absorption of the toxins of the disease. In an infection such as typhoid fever, it is probable that the localization of the bacilli is necessary to the development of certain lesions; that besides the products, which by their presence in the blood and lymph streams give rise to some of the lesions, there are other substances only present or sufficiently concentrated in the immediate vicinity of the bacilli, which give rise to other lesions characteristic of the disease.

Because the morphological examinations of tissue sections, to determine the relation of the bacilli to the lesions of typhoid fever, have in most instances proved unsatisfactory, and have given inconstant results, it has been too readily concluded that any or all the lesions can be developed completely independent of the immediate presence of the bacilli. Our present knowledge hardly warrants such a conclusion, and it may be well to keep in mind that it is from the tissues in which the principal lesions occur that the bacilli can be isolated with great regularity.

The intestinal tract being the usual portal of entry, the lymphatic tissue of the intestine is without doubt often the earliest seat of the organism within the tissues, and the peculiar and characteristic lesions induced in it are probably dependent upon the immediate presence of the bacilli and certain products thereby concentrated. These products, it has been shown, not only give rise to degeneration, but may incite the endothelial cells to reproduction or act chemotactically and attract the cells of the system which aggregate and lead to the tumefaction which may eventually result in necrosis and the formation of ulcers.

After invasion of the tissues, wherever the point of entry may be, the bacilli probably commence operations in the least resistant lymphatic tissue to which they may be borne, and there in the course of growth and death give rise to their various poisons, and gradually spread to fresh regions through the agency of the blood and lymph, and especially so as the primary systemic resistance is overcome. If for some unusual reason the tissues of the intestine are particularly resistant, the lesions induced in them may be slight, or, if we can depend upon the cases reported, entirely absent. This absence of lesions may, on the other hand, indicate that the bacilli have gained entrance to the system by a channel other than that usually suspected, and the bacilli not have reached the intestinal structures.

The appearance of the bacilli in the spleen, bone marrow, mesenteric glands, blood, rose-spots, and urine, is dependent upon the secondary dissemination of the bacilli by the blood and lymph channels. The blood seems to be a very unfavorable medium for the organisms, and to exert a strong germicidal action on those bacilli which are not rapidly carried to a more favorable place of abode. The continued presence of the bacilli in the spleen is probably to a great extent dependent upon the large quantity of blood passing through this organ and the deposit there of the organisms borne by it. We do not know whether the spleen is a particularly favorable place for the organisms and usually acts as a focus of multiplication or not. The immediate presence of the bacilli and their probable degeneration in the spleen possibly indicates the principal cause of the characteristic enlargement of this organ.

The recent work of Neufeld⁸⁸ on the isolation of the bacilli from the rose-spots, and especially that of Fraenkel⁸⁹ on the demonstration by special technic of the organisms in excised spots, indicate not only that the bacilli are spread throughout the system by the blood, but that these lesions are also dependent upon the immediate presence and probably upon the degeneration of the bacilli and are hyperplastic in character. The bone-marrow reactions are possibly of the same character and due to the same causes. This would also seem to support the contention that besides the greater abundance at the points of localization of the bacilli of the diffusible poisons which give rise to the more general inflammations and cell degenerations, especially parenchymatous, throughout the system, there are less soluble products, probably derived from the disintegrating bodies of the bacilli, in all tissues where the bacilli find a place of lodgment or safe abode and multiplication, and that at these points true hyperplastic lesions or chemotactic phenomena are induced, which lead to the characteristic tumefactions and at certain points, as in the intestine, to the subsequent degenerations and ulcerations which are almost pathognomonic of the disease. The association of the bacilli with post-typhoid suppurations lends support to this view.

The fact that the urine frequently contains the bacilli is good indirect evidence of the presence of the bacilli in the blood at some period of the disease. This is the most likely channel by which they reach the kidneys, and through the kidneys in various ways they pass into the urine from the circulation. Conditions giving rise to transient toxic inflammations and to albuminuria may bring about changes favorable for the passage of the bacilli, or in some instances the severer focal lesions which have been described in the kidneys, and which are undoubtedly due to the localization of the bacilli may be the forerunners of the appearance of these organisms in the urine.

Before turning to the hygienic aspect of our subject let us sum up briefly the present status of the bacteriology of typhoid fever, and in so doing call especial attention to those points in the history of the bacilli within the body upon which we are particularly ignorant.

In the first place we do not know the mode or exact portals of entry of the bacilli into the tissues and fluids of the body. The usual site of invasion is, however, in all probability in the lower portion of the small intestine, where involvement most frequently occurs. Some other portion of the gastro-intestinal tract may at times be the site of the primary localization, and the lungs as portals of entry cannot with certainty be ruled out. We do not know whether, after the ingestion of the bacilli, they steadily increase in the lumen of the intestine, there producing their toxins, and by these causing intestinal disturbances and inflammations, and by their absorption systemic symptoms; or whether, when in the lumen, they are unable to increase, but gain entrance in some manner into the lymphatic tissues, and there by toxin production and multiplication give rise to typical infection and lesions.

We do know, however, that it is certainly not usual to be able to isolate typhoid bacilli from the intestinal contents during the first week of the disease, but that this can be done with much regularity toward the middle of the second week. These results point to the lesions and symptoms as being principally due to the invasion of the tissues by the bacilli.

We know, also, that the organisms can be isolated from the rose-spots, which ordinarily appear during the second week; and that they can be isolated from the spleen, and this probably quite as early as the appearance of the rose-spots; and also that they frequently appear in the urine at the end of the second week, and are generally associated with albuminuria.

And, finally, we have seen that they can be isolated from the circulating blood, which fact indicates the most likely channel by which they have reached the spleen, rose-spots, and urine.

After death, the bacilli have been found in connection with lesions in various locations, especially in the mesenteric glands, liver, and bone marrow. The first indicating a direct spread by the lymphatics, and the probable passage of the organisms into the general circulation by the

thoracic duct; the lesions in the liver, a spreading by the portal circulation, and the bone-marrow, like the spleen, rose-spots, and kidneys, again indicating their dissemination during life by means of the general circulation.

Notwithstanding, then, the gaps in our knowledge, we are now in a position to say definitely that no matter what the actual condition is during the first week of the fever—whether the chief symptoms are due to toxin absorption from the intestinal contents, or, as seems more likely, are due to a true infection well established at that time, that by the second week a true tissue infection is established, and the bacilli are scattered, living, and probably multiplying in various situations in the body, which situations they have reached through the agency of the lymphatic and blood streams.

The blood, as has been stated, does not seem to be a favorable fluid for the life of the bacilli, and only in the rarest instances is it at all likely that they multiply in it, but some simply survive long enough in it to reach more favorable places of abode.

Typhoid fever, then, although it cannot be looked upon as a true septicemia, holds an intermediate place between the purer intoxications such as diphtheria, cholera, and tetanus, and those truer types of blood infection in which a growth and multiplication of the infecting bacteria take place in the blood, and which more truly deserve the name of septicemia or bacteremia.

Hygienic Considerations.

During the past few years bacteriology has contributed much to our knowledge of the occurrence of typhoid bacilli in the excretions and secretions of typhoid-fever patients, and a due appreciation of these results should give a sound foundation for hygienic procedures for the limitation of this too prevalent disease.

Mouth and throat secretions and exudations may be carriers of the specific organisms, which fact warns us of the extreme care that should be exercised in regard to sterilization and disinfection of all utensils used by the patient for eating or the taking of medicine, as well as the destruction of all food in contact with which such eating utensils have come. It is no uncommon occurrence for food, especially dainties, to be shared by patients and the family, the patient in many cases having first eaten from the dish which is subsequently passed around.

The feces, being very generally considered the carriers of the organisms, have been disinfected with some regularity where the diagnosis of typhoid fever has been made. Fortunately, as far as we know, the organisms do not appear in the stools, at least in great numbers, before the patients have taken to their beds, and in most cases have, as far as we can determine, entirely disappeared at the setting in of convalescence. The stools, then, are a source of infection generally during a period when their disinfection can

be easily accomplished and only ignorance or carelessness on the part of the attendants is likely to cause the deposit of a non-disinfected evacuation where it may become a menace to the community at large.

Such a statement cannot be made in regard to the urine. Here, the organisms, as in the feces, are generally absent in the early stage of the disease, but may appear later, or even during convalescence, and persist in the urine indefinitely, and often in astonishing numbers. It is not, at least, the general practice to make a special point of disinfecting the urine, even during the febrile period, or to determine the presence or absence of the typhoid bacilli in the urine of patients convalescent or sufficiently recovered to be discharged from hospitals, or in private practice ordered away to recuperate. Such invalids only too frequently resort to some outlying district where the lack of modern sanitary arrangements permits the ready contamination of the water supply and the establishment of a new focus for the dissemination of typhoid fever. Further, the great danger from the unavoidable soiling of the clothes in such cases is too apparent almost to be mentioned, and the infecting of the hands is certainly of frequent occurrence.

The danger from infection by means of the urine is to be strongly emphasized, and undoubtedly many lives and days of illness might be saved if this fact were more generally realized and acted upon.

No patient should be discharged from a hospital before an examination of the urine for the infecting organisms has been made, and, if these are present, an attempt made to eliminate them; or at least the patient warned of his condition and instructed in the care of himself and his fellows. In all cases, in fact, both in hospital work and in private practice the routine disinfection of the urine should be instituted, and before its discontinuance the urine should be determined free from the bacilli of typhoid. Certain facts and procedures may be considered in this connection.

Albumin furnishes food material for the bacilli, if it is present in the urine, and when the organisms gain access to the bladder they often increase enormously; conditions giving rise to albuminuria are probably also conducive to the passage of the organisms from the system through the kidneys to the urine, hence cases showing albumin are especially liable to contain the bacilli; cases in which albumin is absent cannot be considered as always free from organisms, but my experience has been that the bacilli do not tend to linger in such urines.

In districts remote from laboratories, a hanging drop or stained cover-glass preparation of fresh centrifugalized urine might be examined; if rod-shaped organisms are present, these should be looked upon as typhoid bacilli and the urine as infectious until their disappearance. Where possible, a definite diagnosis by means of culture tests should be made. Certainly this problem should be considered very seriously and

is scarcely less important than that of diphtheria, in the case of which routine bacterial exterminations have been established and the freedom of patients restricted. Every precaution should be taken to eliminate the possibility of immediate infection from such cases, as well as the dissemination of the specific organism in communities less well protected sanitarially than our own, and which constantly supply us with many of our cases of typhoid. It is probably only through such precautions that the prevailing death-rate from typhoid fever will be greatly lowered, since we cannot hope to enforce universal purification of water, which we wilfully or ignorantly allow to be contaminated.

General Conclusions.

1. During the course of typhoid fever, usually after the first week, typhoid bacilli can frequently be obtained from the blood, spleen, rose-spots, urine, and feces, and in rarer instances, it is claimed, from the secretions or exudations of the mouth, throat, and lungs. After death the bacilli have been demonstrated in these and other locations and lesions, such as the lymphatic tissues of the intestine, the mesenteric glands, bone-marrow, lungs, liver, gall-bladder, kidneys, etc.

2. The bacilli, as far as can be determined from various observations, do not thrive or even survive long in the circulating blood. They are, however, able to live and multiply at some, at least, of the points at which they are deposited by the blood and lymph, thus forming bacterial foci within the tissues.

3. Morphological examinations of tissue sections to determine the relation of the bacilli to the lesions of typhoid fever have in most instances proved unsatisfactory and have given inconstant results. Some of the lesions, without doubt, occur at points remote from the bacilli. On the other hand, it is probable that the bacilli are intimately associated with many of the lesions, since wherever the bacilli, after gaining access to the tissues and fluids of the body, find lodgment and establish foci, after gaining access to the tissues and fluids of the body, the various products of bacterial metabolism and degeneration are thus concentrated and doubtless give rise to lesions at these points. Moreover, it is not unlikely that certain lesions occur only at points of localization of the bacilli.

4. Typhoid fever, therefore, is an infectious disease, in which a wide dissemination and multiple localizations of the bacilli are frequently demonstrable both during life and after death. During the course of the disease, various tissue changes take place, some necrotic, others hyperplastic. Some of these lesions are at points remote from the inciting organisms; certain facts, however, point strongly to a close association of the bacilli with some of the more characteristic lesions, especially those of the lymphatic tissues.

5. There is a close connection, in time at least, between the appearance in, and disappearance from the intestinal contents, of the typhoid bacilli

and the appearance and repair of the intestinal ulcers. The organisms are only very rarely demonstrable in the stools before the first days of the second week and disappear with the fall of the fever. During the period at which intestinal tissue destruction is most active they can be isolated with great regularity. When continuously absent in typical cases, this may be looked upon as indicating a probable scarcity or absence of intestinal lesions.

6. The urine in a certain percentage of cases contains the bacilli, though not often before the end of the second week. The organisms may not appear until very late in the disease or during convalescence. They may persist for days, weeks, and it has been claimed for months, and are generally associated with albuminuria.

Hygienic Conclusions.

1. The urine of typhoid fever patients should always be disinfected. From a hygienic standpoint bacteriological examination of the urine of patients convalescing from typhoid fever is important and should never be omitted before patients are allowed to go at large, so that proper precautions may be taken to guard against the dissemination of typhoid bacilli by the urine. This is an often neglected source of infection that should be seriously considered in the hygiene of typhoid fever.

2. Feces, of course, should be disinfected at all stages of the disease, but the organisms being present generally only from the beginning of the second week to the fall of the fever and the patient during this period usually being confined to bed, the feces are not such a source of infection to the community at large as the urine.

3. The bacilli may on account of the lung and throat lesions be present in the mouth of those suffering from typhoid fever, hence the expectoration should be disinfected, as well as all eating utensils, etc., used by the patients.

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RESTORATION OF USEFUL VISION IN A COMPLICATED CASE OF ACUTE INFLAMMATORY GLAUCOMA OF TEN DAYS' DURATION WITH VISUAL ACUITY REDUCED TO THE PERCEPTION OF LIGHT.¹

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On the third day of April, 1897, I was asked to see in consultation R. T., an unmarried woman aged forty-two years, who was suffering from a very severe attack of inflammation of the eyes of nine days' duration. The attack, which had been preceded by transient paroxysms of foggy vision lasting for an hour or two, as well as by a halo of colors around artificial lights, was typical of acute inflammatory glaucoma coming on during the night and for the first twenty-four hours producing intense pain. After this time, however, during the whole course of the disease, the pain was scarcely noticeable. Beyond the employment of a boric and zinc lotion nothing had been done for the condition which at the time of my first examination was as follows:

The right eye was intensely injected, the cornea hazy and anesthetic, the anterior chamber shallow, the aqueous turbid, the pupil widely dilated and immobile and the lens quite hazy. No view of the fundus could be obtained. Tension equaled +3 and vision equaled the perception of light, and according to the statement of the patient the latter had been so since the onset of the attack. The light field was considerably contracted on the nasal side.

In the left eye similar conditions were present with the addition of a yellowish degenerated iris and a cataractous lens. The vision was totally abolished.

The history elicited at the time of this examination showed that a similar attack had occurred six years before, but affecting the left eye only, and that in spite of continued medicinal treatment by an oculist the vision was ultimately lost.

With one eye blind and the other possessing only light perception, in a patient with an attack of acute inflammatory glaucoma of nine days' duration, it was realized that no time was to be lost if any vision was to be restored. Leeches, hot fomentations and repeated instillations of eserine not having made any impression upon the eye by the following day, an upward iridectomy was performed under ether anesthesia, the anterior chamber being so shallow that a Graefe knife was employed instead of a keratome. Beyond a smart hemorrhage at the time of cutting the iris, no complication was encountered. The tension was at once restored to normal, the anterior chamber quickly reformed, the eye became much more quiet, the visual field became larger, persons

moving around the room were detected and recognized, but it was noted that the lens was quite opaque and considerably swollen.

The condition continued *in statu quo* for two months, the patient being able to count fingers at one meter, when she came to see me one day with the eye even more markedly inflamed than when I first saw her. The lens was enormously swollen, the anterior chamber shallow, the iris inflamed and attached to the anterior capsule, tension equaled +2 and vision was again reduced to the perception of light.

The conditions, therefore, were now those of a secondary glaucoma brought about by the swelling of the lens and the accompanying iritis, and the only chance to restore any of the vision seemed to be in the immediate removal of the lens matter. Under ether anesthesia, through a three-millimeter flap made in the sclera instead of in the limbus so that the advantages of a sclerotomy might be obtained, most of the lens substance was extracted. The upper portion of the capsule was so tough that it had to be removed with forceps. Notwithstanding the severe inflammatory conditions that were present at the time of the operation, the healing was not unusually prolonged and at the end of a month the patient was tested for glasses and was found to possess $\frac{5}{60}$ vision.

She was now seen once a month for six months, the eye continuing well and quiet when she passed from observation to reappear a year later with the pupil almost entirely closed and the eye presenting the appearance that one sees after chronic iridocyclitis following cataract extraction. She admitted having had two or three attacks of inflammation in the eye in the interim, but had thought nothing of them as they did not seem to disturb her vision very much. Now that the latter was distinctly bad again she had come for advice. The eye was absolutely quiet and vision equaled the counting of fingers at twelve inches.

A small iridocystectomy was now made down and out, the iris being withdrawn with some difficulty with a blunt hook. An opening about $2\frac{1}{2}$ millimeters in diameter was obtained which, after the healing was complete, with the correcting glass enabled the patient to have a visual acuity of $\frac{5}{60}$. The pupil remained open and the vision continued as long as the patient was under observation, which was six months from the time of the performance of the operation; but as to the exact present condition the writer is unable to state from personal observation though he has been indirectly informed that the visual acuity is still maintained and that there have been no further inflammatory attacks.

The case seems to the writer to possess several points of interest the chief of which is the restoration of vision after it had been lost for

¹Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, December 18, 1900.

ten days and notwithstanding the fact that it was necessary to perform the second operation during the height of a severe inflammatory attack involving the anterior portion of the uvea.

RUPTURE OF THE RIGHT KIDNEY: NEPHRECTOMY: RECOVERY.

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RUPTURE of the kidney being a comparatively rare occurrence, I report the following case on this account, and because of the apparently hopeless prognosis and the surprisingly excellent result. All authorities agree that this accident to a kidney is serious and one which demands rapid interference.

The cause of ruptured kidney is external violence applied over the region of the organ, usually when the individual is in a stooping posture. The position, I believe, has a very great deal of influence on the result of a blow in this locality, for when a person is stooping all structures both superficial and deep, are put upon the stretch, offering less resistance and protection to the underlying kidney than does the erect position.

The signs and symptoms are agreed upon by all authorities, and in the main are as follows. A history of violence over the organ; hemorrhage *per urethra*; a sense of fullness about the kidney, often discoverable by palpation; pain extending into the groin and testicle of the same side; weak pulse; pallor of mucous surfaces and the skin, and signs of collapse. All these signs vary with the extent of the injury, although I do not think signs and symptoms should always be taken as an indication of the extent of the rupture. The hemorrhage may be severe, the blood clotting in the bladder and blocking the urethra, or it may be so slow, that in the absence of an exploratory operation the surgeon is misled, and sepsis and peritonitis result from a too-long-delayed operation.

The hemorrhage from the urethra might be confounded with that from an injured mucous surface of the bladder, but, taken with other signs and symptoms, should not be difficult of differentiation. Often the hemorrhage might be severe and still not show externally, due to the clot formation in the bladder, and this condition itself might necessitate a cystotomy for its relief.

W. W. Keen¹ reports five cases of primary nephrectomy with one death, a mortality of 20 per cent., and thirteen cases of secondary nephrectomy with five deaths, a mortality of 38.5 per cent., showing the primary operation to be the preferable one of the two. As to route, he recommends the lumbar operation.

Ernest Laplace² makes the following statement: "The dangers of rupture of the kidney are mainly hemorrhage and sepsis. When, therefore,

the symptoms are such as to indicate marked hemorrhage or sepsis, and especially if a tumor form quickly in the lumbar region, an exploratory operation should at once be done. If severe laceration be present or the kidney's functions be practically compromised, or the hemorrhage be such as to require ligation of the renal vessels, lumbar nephrectomy should immediately be performed, primary nephrectomy being safer than secondary removal of the organ."

On the other hand, Tuffier³ reports five cases of traumatism of the kidney, all recovering, operation in one case only. He believes that operative interference should be exceptional and only resorted to when there is hematuria.

In answer to this I can only reiterate my statement that a severe hemorrhage may occur without being visible, and therefore the hematuria

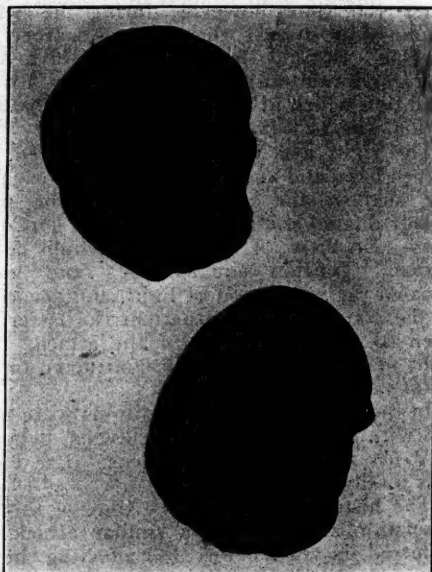


Fig. 1. Ruptured Right Kidney.

cannot be taken in all cases as a reliable sign, either for or against the extent of injury.

Henry Morris⁴ says: "There is great danger in delaying operation in these cases, the decomposition of the clots and the cystitis which is excited by their presence, as well as the frequent catheterization needed, expose the patient to all the dangers of suppuration of the wounded kidney and also to the risk of infection.

The following case, I think, presents the prominent signs and symptoms of severe trauma of the kidney and shows what may be accomplished by an immediate nephrectomy.

Michael S. Pole, aged forty-three years, weight 150 to 160 pounds, height, 5 feet 8 inches; laborer. On April 24, 1900, was struck by a coal-car going rapidly down a grade in the tunnel of the coal-trestle of the Lehigh Valley R. R. This tunnel is cut through solid lime-

stone and the walls are consequently unresisting. Whether he was struck in the back by the car itself and thrown against the side of the tunnel, or whether he struck his back against the wall of rock, I was unable to ascertain and he was not positive about it himself. He was brought five miles to Buffalo on a locomotive and taken to the Fitch Hospital. Immediately on his admission he expressed a desire to urinate and passed nearly one and a half pints of bloody urine. This was before I reached the hospital. After my arrival (about twenty minutes after his admission) he passed an amount of bright arterial blood equal to three pints. Pulse was weak and very rapid. Patient complained of soreness and fulness over right kidney, the latter being evident by palpation. The mucous surfaces and also the entire skin were pale and anemic. Intravenous injections of normal salt solution and hypodermic stimulation were at once employed, together with hot-air baths. As it was the first case of the

hypodermic stimulation, together with considerable quantities of drinking water. At the present time the man is again doing his work as formerly and is in perfect physical condition.

The kidney was somewhat larger than normal and quite friable.

The accompanying illustrations give a good idea of the extent of the damage and the resultant scar.

The conclusion I draw from my experience in this case is this: In cases of trauma of the kidney, do an exploratory operation, for by this means alone is it possible to learn the extent of the injury.

For the photographs in this case I am indebted to Mr. N. B. Ludlum, Assistant to Superintendent Van Allen of the Lehigh Valley R. R. Co.

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- ⁴ Henry Morris. *Clinical Jour.*, Aug. 1, 1894.

MEDICAL PROGRESS.

Radical Cure of Abdominal Hernia.—Dr. SALISTSCHIEFF (*Centralbl. f. Chir.*, No. 13, 1901) states that he has succeeded in making actively contractile firmly united muscle-flaps for the closing of old abdominal hernia at the site of operations or wounds. In one of his described cases an obstinate hernia followed a wide stab wound through the left rectus abdominis in its upper half. Freely opening the sheath of the muscle above and below the locus of the hernia and thus exposing the cut ends of the muscle, he constructed an upper and a lower rectangular muscle-flap respectively out of the upper and lower stumps of the divided muscle. These he turned up and down, approximating their cut edges over the exit of the hernia, closed by the usual methods and there sutured them. Primary union and subsequent observation of the case showed that the result was most satisfactory. In another patient the hernia was in the right inguinal region along the border of the right rectus. In this case the muscle-flap was cut from the rectus so that it could be swung on the pubic attachment at a point outward across the hernial opening, where it was sutured to the freshened edges of the latter. This flap also lived to be contractile and fully adequate for curing the rupture. The other steps in these operations were the same as for closing any hernia wound. His patients have been under observation for many months and the results seem to be permanent.

Medical Hebetude.—An absolute lack of surgical-obstetrical sense is clearly shown to the startled reader in J. McELROY's recent report of a case (*British Med. Jour.*, Apr. 6, 1901). Mrs. F., aged thirty-seven, multipara, six months pregnant, had felt no movement for three weeks. In examination the child was pronounced dead.

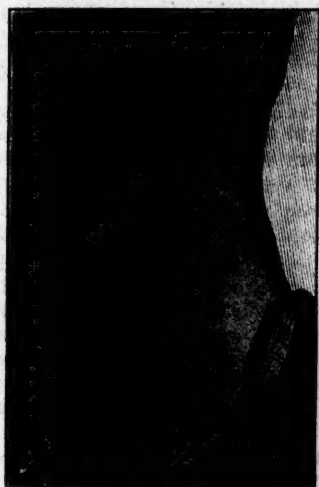


Fig. 2. The Resultant Scar.

kind I had ever seen I called in Dr. E. J. Meyer of the hospital staff to verify my diagnosis. This he did and immediate operation was decided upon.

The man was quickly prepared and a lumbar nephrectomy performed. The hemorrhage was very severe and for a few moments the result looked extremely doubtful. Normal salt solution and hypodermics were again resorted to, with good results. I found the kidney torn about three quarters through and in its removal the rupture was completed, the organ being removed in two pieces. Several ligatures were applied to the vessels, the wound cleansed and closed throughout two-thirds of its extent, the remaining third being packed with iodoform gauze.

The left kidney assumed its double duty without trouble and the patient made an uninterrupted recovery. The after-treatment consisted of sweating, injections of normal salt solution and

Two days later she was comatose; stertorous breathing, frothing at the mouth, pupils dilated and fixed. Urine loaded with albumin. Jalap, bromide and chloral ordered. Frequent convulsions. Calomel, jalap and ginger prescribed. Violent delirium. Seven days from the onset of this eclampsia a "macarated" fetus was passed!

Does Typhoid Immunize?—In a series of reports of cases from the Cape and from India, of soldiers and orderlies of whom he had very complete histories, B. NICOL (*Lancet*, Apr. 6, 1901) gives his reasons for believing that such immunity does not exist. In these cases a second attack occurred within a few months of the first, and in some instances, a third. In all, Widal's test was distinctly present but a short time prior to the secondary attack. This seems to him to cast a doubt on the value of the test for determining the presence of immunizing substances in the blood. That immunity exists, he has no doubt; it is not, however, brought to light by Widal's test, nor is it the result of a previous attack. It is a purely individual characteristic which unfortunately for those who might otherwise be guarded from infection, there is as yet no means of determining.

Skiagraphy and Calculi.—C. L. LEONARD (*Annals of Surgery*, April, 1901) after an analysis of the results of skiagraphic examination of 136 cases of actual and suspected cases of renal calculi and the discovery among them of seventeen renal and nineteen ureteral stones, draws the following conclusions: (1) Skiagraphy furnishes accurate and valuable negative and positive diagnosis; (2) ureteral calculi are more common than has been supposed, perhaps as much as 50 per cent. of all cases; (3) equally accurate diagnosis of calculi is impossible by all the other means; (4) this method is comprehensive, aids operative intervention by locating the calculi and by excluding the opposite kidney; (5) non-operative treatment in the absence of a negative X-ray diagnosis is irrational and dangerous in all suspicious cases; (6) this method has precision and mechanical exactness in its favor, but, in order to avoid error, accuracy in technic and care in interpreting results are needed; (7) the diagnosis by this method of small calculi low down in the ureters, which may be expected to pass, make a non-operative treatment rational; (8) negative diagnosis does not preclude exploratory nephrotomy, but does render unnecessary actual incision into the kidney in search for calculi; (9) dilatation of the ureters in the male may be practised with the aid of a suprapubic cystotomy for guiding the sounds from the urethra to the ureter. It will be as serviceable in the male as in female, without the cystotomy.

Gastric Insufflation.—R. OEHLER (*Semaine Médicale*, No. 12, 1901) states that although percussion of the stomach unaided is a valuable diagnostic means, it is very uncertain unless combined with a distention of that viscus with air, either through the medium of some effe-

vescent mixture internally administered, or of the stomach-tube through which air is pumped at once into the organ, or of a large tube passed partly down the esophagus and used the same as the gastric siphon. All these procedures have objections for the practitioner and patient alike. A simple, rapid means of insufflating the stomach he has found to be the Pollitzer bag. The patient is placed in the dorsal decubitus position and the tip of the bag is passed into one nostril while the other is occluded. While the patient swallows water he is compelled by the bag to swallow air also. A few repetitions of the act are enough to dilate the stomach in most individuals.

THERAPEUTIC HINTS.

Hemoptysis.—If the bleeding is moderate in amount, LEMOINE (*Le Nord Médicale*, Apr. 1, 1901) advises a hot foot-bath, and purgation with:

℞ Sennæ
Sod. sulphat., } aa.....gm. 15.0 (℥ss)

Aq. bullient. ad.....c.c. 500.0 (Oi)

Or if the bleeding is subsiding use simply magnesium sulphate. For continuous small bleedings a good prescription is:

Quinine sulphat....gm. 0.30 (gr. v)

Ergot pulv..... 0.50 (gr. viij)

in capsule, every morning. In sudden large hemorrhages, omit the foot-bath and envelop the legs in iodized cotton and bathe the hands in hot water to open up the peripheral vessels. Perchloride of iron is useless, and ergot not very good, but ergotole may be given hypodermically. Perfect rest, control of cough, and avoidance of food are necessary for a time.

Melancholia.—M. ALLEN STARR believes it better to keep a melancholic asleep than to attempt to relieve his distress by diversion or anything which demands a mental effort which he cannot make. Severe cases require absolute quiet and rest in bed, and precautions should be taken against sudden impulses to suicide. The treatment of light cases without delusions consists in increasing nutrition by frequent feeding, milk punches, tonics, stimulants, laxatives, and aids to digestion, and the forcing of fluids, especially milk and beef extracts. Glycerophosphates, intestinal antiseptics, warm baths, alternating hot and cold douches, massage, out-of-door exercises without fatigue, vasodilators and cardiac stimulants, all have their value. Insomnia must be combated by hypnotics, which must be changed from night to night. Opium is constipating and should be used only when there is distress, but it does not cause the habit and is specific in relieving the mental symptoms. Quiet may be obtained in a country place or sanitarium, not in a city.

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SATURDAY, MAY 11, 1901.

NEW YORK'S OPPORTUNITY.

As the far away rumbles of thunder are but precursors of a coming storm so the periodic signs of discontent regarding the care and treatment of the insane as now attempted, should presage some radical departures in the near future.

The taxpayer is unquestionably paying too much money for the results obtained in the care and treatment of its insane, and New York State, as a thrifty community, should heed the advice recently put forth in the Report of the State Charities Aid Association to the State Commissioners in Lunacy.

It takes up one phase of the problem, already dwelt upon in the MEDICAL NEWS in December last and more recently in a paper on "Charity and at Less Cost," that is, that more money could be spent on the acute insane and less on those incapable of being helped.

This report says: "Insanity is not necessarily a disease confined to the brain, as is commonly supposed. The brain and the central nervous system are so intimately connected with every tissue and organ in the body that disease or disorders outside of the nervous system may be

causes of insanity. Thus, mental symptoms may result from the defective assimilation of food, from impaired circulation, from malnutrition and from numberless other morbid conditions. In the nature of the case, these causes are as obscure as they are numerous. To isolate them, to recognize them, to determine their mode of action, is the most important object in the study of mental diseases to-day. For experience has shown that treatment directed toward causes is the only rational method of combating disease. The investigations which such work implies can only be carried on by the most industrious and skilful workers, and should be conducted by the ablest of our alienists and neurologists.

"Why should not the insane have the benefit of the best medical skill our country affords, and which is now so freely given gratuitously by the most distinguished members of the profession to patients suffering from other diseases in other hospitals of every city of this State?

"The plan we would advocate is the erection, in several of our largest cities, of comparatively small Reception Hospitals, or Psychopathic Hospitals, as branches of existing State Hospitals and governed by the same boards of managers. These hospitals, designed for the reception and temporary treatment of insane patients, should be organized on the same general plan as are the New York, Presbyterian, St. Luke's, St. Vincent's, Roosevelt, and Mount Sinai Hospitals of this city, and other well managed hospitals elsewhere. Cases possibly curable would doubtless be kept for a limited period in the reception hospital under the daily care and constant advice of the most eminent members of the profession, until it was thought best to send them on to the main hospital.

"It is also desirable that the reception hospital should open its doors for clinical teaching. It is in the cities that are centered the medical schools which send out year after year graduates who know but little of mental diseases, because they have not had the proper facilities for studying them. Many of these young doctors begin their practice with very slight knowledge of a group of diseases which they will inevitably during their professional career be called upon to treat. It is also under the roof of the New York Reception or Psychological Hospital that the already established Pathological Institute would naturally find its home."

As for the chronic insane they should be sent to the country where agricultural colonies could

be formed which under efficient, non-political management, could be made almost, if not quite, self-supporting.

Small psychopathic hospitals in large cities for the acute and curable insane, and large agricultural colonies in the country for the chronic insane is the answer to one phase of the question, How best to take care of our insane?

THE AMBULANCE SURGEON AND YELLOW JOURNALISM.

THE average newspaper writer never succeeds so well in producing a comedy as when he attempts a tragedy, and the sublime height of journalistic comedy is reached in reports of medical affairs. A good story bears telling twice and an element of fiction merely increases its interest. The ambulance surgeon furnishes the foundation in many cases and upon some simple occurrence the yellow journals erect a melodrama. And every month or two they repeat the tale.

Their latest fabrication concerned the death from cerebral hemorrhage of a woman at the New York Hospital, after what was claimed to be an incompetent and insulting diagnosis of the ambulance surgeon who left the patient, but was subsequently obliged to remove her from the police precinct to the Hospital. It was shown that the policeman on duty and the matron at the station house, both obviously persons whose medical opinion must be of great weight, differed as to diagnosis from the surgeon, of whom it was even insinuated that he was young. The usual dialogues were well written and showed a wealth of inventive genius, but of course failed to agree in the various papers.

The foundation of fact was that the woman, when seen by the surgeon, refused to be taken to the Hospital and wished to go to her home in a cab. When asked by the police for a diagnosis to satisfy the red-tape of the precinct blotter, contusion of the wrist and alcoholism was given, the most probable according to the doctrine of chances. The woman was later removed by the police to the precinct's station and subsequently became worse. When again summoned the surgeon at once took the patient to the Hospital.

As is well known by many, the New York Hospital regards the affairs of a patient in the light of professional confidence as would a private physician, and in this sets an example which might well be followed by others less reticent. For this reason the house staff are not allowed

to make any statements for publication, and the official replies to inquisitive reporters are marked by a characteristic brevity which requires elaboration by their recipients before they will satisfy the readers of a yellow journal. To one who knows the number of grains of salt with which these journalistic fictions founded upon fact must be taken, such malicious slander of a surgeon at first excites indignation. A man while simply doing his duty is accused of being the cause of the death of a woman who had declined his aid, and various brutal remarks are credited to him, while his name adorns any convenient cut in the paper's stock.

But why should the episode be regarded seriously by any one? Of course the reporters must live and although at times they employ means beneath contempt, as in this instance, their ludicrous exaggerations add to the gaiety of life. Mark Twain, who cabled in reference to an announcement of his death that the reports in regard to the state of his health were much exaggerated, understood the reporter's nature thoroughly. Unvarnished facts are not marketable. Furthermore, since it requires a hospital training to demonstrate to a physician that a differential diagnosis between various forms of coma and their prodromata cannot be made, in some cases, with much more accuracy than characterizes a newspaper report, why should one of these writers of daily fiction be supposed to realize this fact? And what right has a hospital to refuse to discuss the affairs of patients when a reporter wishes to know them?

FOOD AND DIETETICS.*

HORACE WALPOLE said of somebody that he never made a bad figure but as an author. How fittingly this saying applies to many medical men of note who have taken up their pens in the attempt to communicate the results of their experience is unfortunately only too apparent when one comes to read critically what they have written. In spite of the assiduous endeavors of certain philanthropic medical editors to guide the literary aspirant through the mazes of syntax and autography; in spite of the constant appearance of such estimable examples of the doctor's *vade mecum* as "Polysyllabics Plainly Presented" and "How to Write Though a Physician," the number of really successful medical authors—

* Food and Dietetics. By Robert Hutchison, M.D., Edin., M.R.C.P. New York: Wm. Wood & Co., 1901.

from a literary standpoint at least—is minimal. When, therefore, we come across a book like "Food and Dietetics" and find it fascinating both in matter and manner from start to finish, we cannot refrain from commenting editorially on our find. The author of this really "notable book of the season," Dr. Robert Hutchison of London, is deserving of the highest encomiums as a medical man for presenting to the profession what we consider to be the most noteworthy treatment of a most important subject, which has appeared in a long time, and we offer him our heartiest congratulations as an author for having succeeded in confiding his ideas to paper in a style eminently perspicuous and entertaining. We learn from the preface that the contents of this book were first addressed to the students of the London Hospital in the form of a course of lectures, a fact which impels us to extend to those students our congratulations upon their good fortune.

It is self-evident that no man can be a really good physician who does not know the nutritive constituents and relative values of foods. Such knowledge constitutes in large measure the basis of therapeutics. And yet how many doctors there are who, grossly indifferent to the immense importance of the diet in sickness, content themselves with the mere drug treatment of cases, while they leave the selection of the fuel by which the fires of life are to be kept burning to the discretion of parents or nurse.

It does not take the really wise physician many years to discover the paucity of specifics in his medical armamentarium. Arrived at this degree of sapientcy, he expends his efforts in instilling into the minds of those intrusted to his care the great lessons of preventive medicine, and paramount among these the necessity of fortifying the body against the inroads of disease by means of properly selected foods.

To the many who are themselves in need of the knowledge in regard to food and dietetics, which will enable them to deal most satisfactorily with their patients, we recommend Dr. Hutchison's book. In it they will find traditional errors annihilated, cherished delusions dispelled, and in their places solid, well-substantiated facts.

We feel, under the circumstances, that to reproduce some of the very many interesting things of the book would be too much like

picking out "gems" from Shakespeare and so refrain. We feel safe in saying, however, that its perusal will satisfy the most critical. Even with regard to such commonplace articles of diet as butter, milk and eggs, the author is able to tell us a great deal that is eminently practical and useful in our daily handling of the sick.

Of particular interest is what he has to say on vegetarianism, alcohol and the cooking of food.

ECHOES AND NEWS.

NEW YORK.

Hospital Opening.—The New York State Hospital for the care of Crippled and Deformed Children located at Tarrytown, N. Y., will be opened Friday, May 17, 1901. Bishop H. C. Potter will preside. Drs. R. F. Weir, A. A. Smith, and W. M. Polk will deliver short addresses.

Columbia University Appointments.—Dr. L. Emmett Holt has been appointed Clinical Professor of Pediatrics; Drs. Evan Evans, D. Bovaird, E. Solley and N. B. Potter, tutors in Medicine. It is announced that Dr. F. Peterson has been appointed Clinical Lecturer of Psychiatry.

East Side Doctors' Club.—Physicians on the East Side below Fourteenth street have formed the East Side Physicians' Club, with headquarters at 165 Henry Street. The membership is 175.

Cornell Medical College Library.—President Schurman has announced that negotiations carried on through the university library officers have succeeded in securing for the Loomis Laboratory of the Medical College the complete pathological library of the late Dr. Felix Victor Birch-Hirschfeld, who was Professor of Pathology and Pathological Anatomy in the University of Leipsic, and Director of the Leipsic Pathological Institute.

Woman's Hospital College Addition.—The trustees of the New York Medical College and Hospital for Women have now sufficient funds on hand to proceed with the erection of the new hospital building to adjoin the present site in West One Hundred and First Street, and the contract will be let in a few days.

New York Academy of Medicine.—A stated meeting will be held on Thursday evening, May 16th. Dr. Stephen Smith will deliver a memorial address on the late Dr. S. S. Purple, formerly President of the Academy. The following papers are announced: "Sitophobia of Enteric Origin and Syphilis of the Liver," by Dr. Max Einhorn; "The Intestinal Intoxication Occurring in Mucous Colitis in Young Children," by Dr. Henry Koplik. Discussions by Drs. Jacobi, Chapin, Northrup, Southworth and others.

Manhattan Dermatological Society.—A regular monthly meeting was held on Friday evening, May 3rd, at the residence of Dr. A. Bleiman, 206 East 48th Street. Dr. Wm. S. Gottheil was in the chair. Dr. R. Abrahams presented a woman with pityriasis versicolor limited to the palms. Such cases were rare, only one other, that of Gottheil being recorded. Microscopical examination of the scales by Dr. Gottheil showed the presence of the *microsporon furfur*. At present the palms showed a superficial scaliness, although before the patient had washed so frequently that there were light and dark yellow patches of various sizes and shapes. Dr. Gottheil remarked that the clinical picture was not as characteristic as in his case, but that the microscopical appearances were classical. Drs. Bleiman and Weiss thought that from present appearances a diagnosis of telositas or eczema would be more likely. The microscope however settles the diagnosis. Dr. J. Sobel advised the application of Lugol's solution in order to bring into prominence pale and imperceptible lesions (Allen's test). Dr. E. L. Cocks showed two cases of prurigo in native-born children of eight and nine years respectively. Both gave a pre-urticarial history and presented a papular eruption on the extensors, enlarged glands, and a nutmeg-grater feeling. Dr. R. Abrahams considers both chronic urticaria. Pilocarpine acts well in these cases. Dr. J. Sobel fails to find the picture of prurigo in either case. The papules lack the firmness of prurigo, the characteristic buboes are not present and he cannot detect the feeling of a nutmeg-grater. Both, to his mind, are chronic papular urticaria. Dr. L. Weiss would call both cases lichen urticatus or chronic lichen simplex. The patients lack the anemic, haggard look and the buboes of prurigo. Dr. Obendorfer says neither case looks like prurigo. He misses the great infiltration of the skin, the firmness of the individual lesions and the adenopathy. He would call them chronic papular eczema. Dr. Gottheil remarked that he inclines toward a diagnosis of prurigo. The picture is characteristic neither of prurigo nor papular urticaria. Dr. L. Weiss presented a patient with *eczema neuroticum vegetans* of the lower extremities. There were patches with somewhat healed centers, the individual lesions consisting of small papules simulating lichen planus. Dr. E. L. Cocks considers it lichen planus plus eczema. Dr. Obendorfer calls it eczema. Dr. Bleiman thinks it primarily pruritus senilis. Dr. J. Sobel would call it mycotic eczema on account of the more or less sharply-defined edges, the somewhat circular form, the healed centers and the persistency. Formalin and chrysarobin act well. Dr. R. Abrahams calls it parasitic eczema. Strong nitrate of silver solutions (50 per cent.) and carbolic acid are recommended. Dr. Kinch thinks it an eczema. Dr. Gottheil stated that the papules are typically those of eczema. Dr. L. Weiss showed a woman with *rosacea* of the cheeks. Stretching of the skin enables one to see

the capillary circulation. Dr. Geyser advised treatment with the negative galvanic needle inserted at right-angles into the vessels. Dr. Bleiman presented a case of favus of the nails. The scalp showed evidences of favus. Dr. Obendorfer showed a probable *acne varioliformis* of the scalp, with numerous bald spots. Dr. R. Abrahams would diagnose *acne vulgaris* and folliculitis. Dr. E. S. Cocks sees no *acne varioliformis*. Dr. J. Sobel finds *acne pustulosa* and folliculitis abscedens. Dr. L. Weiss states that the bald regions speak for folliculitis decalvans. Dr. Ochs presented a patient with resolving syphilis. Dr. Bleiman presented a pityriasis rosea resembling seborrheal eczema and demonstrated the continuous treatment of scabies with Wilkinson's ointment.

The Late Dr. F. J. Brockway.—At a recent meeting of the West End Medical Society the following minute was adopted: "The members of the West End Medical Society desire to express their sorrow at the death of their fellow-member and former President, Dr. Fred J. Brockway. This is to be taken not merely as a formal record of the feeling of the Society as a body, but as the expression of a genuine sense of loss on the part of each individual member.

"While the death of our colleague makes us regret the loss to the profession of his solid abilities as a practitioner and teacher, on the other hand, his sterling qualities as a man and friend, his absolute reliability, his sound common sense and last, but not least, his fund of quiet humor, all constitute a claim to the personal regard of each member of the Society such as to call forth that regard in its highest form. The Society wishes Dr. Brockway's family to know of the great esteem it had for him and it hereby expresses to them its deepest and most heartfelt sympathy.

"Resolved, That the above minute be entered in full on the records of the Society and that a copy be sent to the family of our deceased colleague.

"BERN B. GALLAUDET, M.D., JAMES E. NEWCOMB, M.D., Committee."

PHILADELPHIA.

General Anesthesia in Heart Disease.—The May meeting of the College of Physicians was devoted to the discussion of the relation of diseases of the heart to surgical operations, especially to the use of general anesthesia. Dr. W. J. Mayo, of Rochester, Minn., spoke of preëxistent heart disease in reference to surgical operations. Dr. Mayo said that the reverse power of the heart must be taken into consideration in all cases. He has found this to be greater in old age than in infancy. Valvular lesions in persons between the ages of ten and forty are usually well compensated and anesthetics generally cause little risk. Later in life myocardial change is usually associated with valvular lesions, many of the sudden and unexpected deaths occurring soon after operation being due to such change. A

knowledge by the surgeon and anesthetizer of the presence of cardiac lesion is a great safeguard against danger.

The Safest Anesthetic to Use in Organic Disease of the Heart and Vessels.—Dr. H. A. Hare spoke on this topic, saying that the majority of accidents in these cases were due to the shock of operation instead of the anesthetic. The condition of many such subjects improves under an anesthetic. The ordinary clinician and surgeon does not pay enough attention to the vessels, being satisfied with examining the heart. The cardiovascular tone and blood-pressure are all-important questions. Ether, although the safest anesthetic we have, is contra-indicated in some cases of high arterial tension. American surgeons do not often enough employ atropine for its effect on secretions. Oxygen and an anesthetic should never be given by allowing the gas to bubble through the anesthetic. An increase or decrease of oxygen means the same effect on the anesthetic. Each should be given alone. General anesthesia is better than local or spinal anesthesia in valvular or myocardial disease. Dr. Hare believes that anesthesia by intraspinal injection will soon be a medical curiosity.

The Cardiac Complications Which May Arise During Operation.—This paper was read by Dr. J. M. T. Finney of Baltimore. He finds that the so-called heart cases bear ether well. Fatalities occur more frequently under inexperienced anesthetizers. Heart disease of itself does not contra-indicate the use of ether. Chloroform is especially dangerous in cases of myocardial change. The contra-indications to ether are respiratory rather than cardiac. Anesthesia is dangerous when the hemoglobin is under 30 per cent. Dr. Finney has studied 150 cases of heart disease and the effect of anesthetics upon them. The only appreciable bad effects were in cases of myocardial change. He has the anesthetizer keep a chart of each case, showing the pulse frequency each five minutes.

Cardiac Complications Which May Arise After Operation.—Dr. Alfred Stengel spoke on this topic. Inferences regarding this question should be drawn from simple examinations under anesthesia or from minor operations. In gynecological cases the heart should be studied before and after the operation. Myocardial disease is common in cases of myoma of the uterus. Terminal pneumonias ascribed to aspiration or irritation are often due to failing circulation and the anesthetic is only the exciting cause. Pulmonary embolism is more frequent after gynecological operations.

CHICAGO.

Woman's Medical College.—At the annual meeting, held April 24th, Dr. Eliza H. Root was recommended for Dean of the College during the absence of Dr. Marie J. Mergler, who is away on a sick leave. Dr. John Ridlon was elected Secretary of the Faculty.

Sentence of a Midwife.—A midwife was found guilty of murder and sentenced to fourteen years in the penitentiary. The offense was the common one of criminal abortion. The patient died.

St. Luke's Hospital.—This institution is a beneficiary under the will of the late Mrs. Jennie L. Young, to the extent of \$5,000.

The Kerr Bill.—This bill, which required all manufacturers of patent medicines to print the formulæ of their productions on the bottle or wrapper, and also to designate whether the medicines contained any harmful drugs, was defeated in the Senate.

Cook County Hospital Investigation.—The Committee, which has been investigating the charges of general bad management, neglect and cruelty at the Cook County Hospital, has submitted its report, and finds the charges not sustained. Many of the charges were built up on the most flimsy pretexts. These were carefully probed by the jurors, who gave several days of their time to this work alone. The report makes several recommendations for the benefit of the Institution, particularly with regard to the heating and ventilating systems, and praises the work of the nurses whom it terms a body of "faithful, conscientious and able women." The investigation into the working conditions, however, brought the jury to the conclusion that the nurses are much overworked, and the following comment was made on this point: "It would seem that such increase as is possible in the staff of nurses would greatly relieve the faithful women now doing this work, and would also result in more comfort to the sick, insuring to them many small attentions which are now impossible." Attention is called to the fact that the food served to patients had been condemned by several witnesses, but the report states that an examination of the supplies at the hospital showed them to be good and wholesome. Most of the complaints are ascribed to poor service and lack of variety. A tribute is paid to the internes, who are described as "bright young physicians, who have won their positions by competitive examination." After paying this compliment, the report continues: "Although most of the evidence heard would indicate that the internes are entirely subordinate to the attending physicians, we think that their desire for knowledge and experience in many cases outweighs their regard for hospital rule and for conservatism in the treatment of patients." The remedy suggested for this is the appointment of a house physician to supervise the medical part of the hospital work, if the three schools of medicine could agree on a capable man. A decrease in the number of doctors on the attending staff and the formation of a more perfect organization are also urged. The excellent operating-rooms and management of clinics are warmly praised in the report, and the management of the hospital is congratulated on the state of perfection to which these details have been brought. Finally, the report states: "While

we have ventured to criticize much in the condition and management of the hospital under the present régime, we think that the main shortcomings of all our county institutions are due largely, if not wholly, to the pernicious influence of politics and politicians in municipal affairs."

Chicago Medical Society.—At a clinical meeting, held May 1st, Dr. John B. Murphy exhibited a patient upon whom he had performed an abdominal colopexy for prolapse of the rectum. He also reported cases of lymphosarcoma of the mesentery, excision of the intestine for malignant disease, and Pott's disease. Dr. E. Wyllys Andrews reported cases of gastrostomy, umbilical hernia, strangulated scrotal hernia, tendon suturing, nephrectomy for malignant disease, renal calculi, tetanus, cerebellar tumor, and laparotomy for perforation of the intestine in a case of typhoid fever. Dr. Wm. E. Morgan exhibited a case of goiter complicated by stenosis of the trachea. Dr. George W. Webster showed two cases of weak heart and, after giving briefly the histories of the cases and the physical findings, he discussed the etiology and prognosis in cases of weak heart.

Chicago Pediatric Society.—At a meeting, held May 2nd, the following officers were elected: President, Dr. W. S. Christopher; Vice-President, Dr. J. W. Vanderslice; Secretary and Treasurer, Dr. Emma M. Moore; Trustee, life member, Dr. John C. Cook; Trustee, short term, Dr. D. W. Rogers, and Trustee, three years, Dr. Alfred C. Cotton.

Pathology of Ulcer of the Stomach.—Dr. William A. Evans discussed the pathological anatomy and histology of ulcers of the stomach. As to location, the seats of ulceration are the lesser curvature, the posterior surface, and near the pylorus. Occasionally the duodenum and the esophagus are the seat. The analysis of 7,700 autopsies by Stawell would indicate that ulcer of the stomach is about as frequent in men as in women. Gluzinski says the majority of the ulcers occur in the men. The usually accepted figures are about twenty times as often in women as in men. Greenough and Joslin, as a result of a study of the cases in the Massachusetts General Hospital from 1888 to 1898, conclude that it is four times as frequent in men as in women. Saundby says it is twenty times as frequent in women as in men. Hyperacidity and ulcer of the stomach are generally associated. The speaker's opinion is that the hyperacidity results from the continued irritation of the ulcer, and not the ulcer from the hyperacidity. In many cases of marked hyperacidity in a young woman, ulcer as an etiological factor is to be borne in mind. In ulcer of the duodenum no hyperacidity of the gastric juice can be demonstrated as a general proposition.

Among the other etiological factors recognized are embolus and thrombus. The anatomical arrangement of the celiac axis and of

the gastric artery would make embolus infrequent. Besides, embolus is not common in people presenting the clinical picture manifested by a case of ulcer of the stomach. Thrombus can frequently be demonstrated.

That there is a relation to chlorosis is beyond question. Again, there is the difficulty of deciding which is the primary lesion. On the one hand, the loss of blood and, perhaps more important still, the direct absorption through the ulcer of incomplete digestion products can produce chlorosis. Usually the degree of anemia bears some relation to the loss of blood. On the other hand, women with ulcer of the stomach usually give a history of anemia preceding the ulcer. The same is not true of men. The ulcer does not repair until the anemia is lessened according to Fütterer. This might be true, and the chlorosis be only a contributing factor. Hemmeter and Stokes have collected 21 cases of syphilitic ulcer in the literature up to 1900. As to the relation of ulcer to carcinoma, Fütterer holds that carcinoma develops right in the ulcer as a result of physical injury. It develops on the side of impact.

Treatment of Ulcer of the Stomach.—Dr. James B. Herrick read this paper. He said that many of these ulcers heal spontaneously. The conditions that tend to keep up the process are the general chlorotic state, the local circulatory condition, but above all, the irritation from food which excites peristalsis and vomiting and causes an outflow of the hyperacid gastric juices. Theoretically, the best results should be obtained from the treatment securing most nearly perfect rest of the stomach, including freedom from peristalsis, from movements of the viscus, and attending movements of the body. Experience shows it to be true, that the more nearly these ideal conditions are met the better the result. Drug treatment is unsatisfactory. Treatment by light or milk diet gives better results. The results of Leube and others who employ his method are by far the best. Leube puts his patients to bed, applies hot applications over the epigastrium, and gives a minimum amount of carefully-selected food with occasional drugs to correct hyperacidity. Absolute rest in bed of from two to six weeks was advocated. Nothing should be allowed by the mouth, not even water, for from three days to three weeks. Nourishing enemata should be given at regular intervals; a cleansing enema of water given every morning; gradual substitution of liquid by the mouth for the enemata could be allowed when the pain, tenderness and vomiting had entirely ceased. It was better in all cases, if possible, to keep the patient on rectal feeding for at least one week. Light diet should be continued many weeks after the patient had left the bed. Attention should be given to the anemia preferably by the administration of iron. The results of the treatment were almost immediate disappearance of the nausea, vomit-

ing, and pain, and a rapid lessening of the tenderness on pressure. Hunger, thirst and sleeplessness were scarcely complained of after the first twenty-four hours. Emaciation and weakness rapidly disappeared when the feeding by the mouth was begun. In recent cases of ulcer a cure could be quite confidently predicted. In older cases of months or years standing there was generally an improvement, occasionally a cure. Certain cases were clearly surgical, chiefly those with alarming severe hemorrhage, or repeated small hemorrhages, not disappearing under rest and rectal alimentation; also cases of perforation, with peritonitis; cases complicated with adhesions, perigastritis, dilatation, etc., and cases with obstinate vomiting, or severe pain that resist the treatment by alimentation. Believing that other methods of treatment were unsatisfactory and that this method by breast and rectal feeding offered the most favorable conditions for the natural healing of the ulcer, that it was safe, practicable and efficacious, he believed it should be tried in all cases and not reserved for the complicated or desperate ones.

GENERAL.

Dr. Vaughan and Women Students.—It seems that the daily press has been making much of some remarks of Dr. Vaughan relative to female medical students. From authentic sources it is learned that Dr. Vaughan did not make the remarks that have been attributed to him.

Imported Rats Die of Plague.—Secretary A. C. Young of the State Board of Health says that a case of bubonic plague was discovered a few days ago in Waldoboro, Me., in some pet rats brought from the Philippines by a soldier.

Honor to Dr. Chaillé.—Dr. Stanford E. Chaillé, Dean of the Medical Department of Tulane University in New Orleans, has been given the degree of LL.D. by the University on his completion of fifty years in its service.

Brain Topography.—Prof. Gustav Retzius of Stockholm, in a new issue of his *Biologische Untersuchungen*, publishes an interesting paper on the brain of Mme. Sonya Kovalevski, the eminent Russian mathematician, who was born in Moscow in January, 1850, and died in February, 1891, seven years after her appointment to an associate chair of mathematics at the University of Stockholm. Professor Retzius finds in the brain of this gifted woman no marked departure from the ordinary type of brain-structure, it being of the normal form found in women generally, although of rather small size and of limited complexity. Of a certain interest is the shortening of the Sylvian fissure, a feature which was also distinctive of the brain of the mathematician Gyldeń. Professor Retzius, as a result of his researches, is not disposed to deny the interesting conclusion latterly reached by Professor Möbius that the "mathematical centrum" is situated in the lateral parts of the frontal lobes of

the brain—a view with which the condition of the brains of Gyldeń and Kovalevski in no way conflicts; but he considers our knowledge of the subject too limited to permit as yet of a definite conclusion being arrived at. Rather would he believe that this problematical centrum is situated in the parietal region of the brain.

Strike of Physicians.—The physicians' strike in Germany, noted in a recent issue of the *MEDICAL NEWS*, arose in connection with the system of sickness insurance, by which some thirty million Germans are entitled to free medical attendance on payment of a small sum. Theoretically, nothing could be more perfect than such a coöperative arrangement. Practically, it has been found that the interests of the sickness bureaux (*Krankenkassen*), the doctors, and the patients clash at almost every point. The bureaux endeavor to promote economy, and desire that few cases of sickness shall be reported. The people feel that the doctors treat them unfeelingly. The doctors, on their part, find the bureaux hard taskmasters. In Leipzig the conflict has declared itself frankly. The bureau physicians, as in other cities, had organized an association to represent the profession. This commission attempted to negotiate with the bureaux for better terms and less irksome conditions of service. The bureaux refused to deal with the commission, but were willing to hear individual complaints. It was the old question of "recognizing the union." The doctors did just what workmen do under the circumstances—struck, and the work of the Leipzig Bureaus is crippled.

At Munich the case of the doctors was still harder. Their average profits from the Bureau service were about \$75 yearly. The pay was the same for the most difficult and for the lightest cases. The united effort of the physicians raised the average pay for a call to about fifteen cents. They demanded as well a special tariff for obstetrics and other difficult operations, and when such recognition was refused, like their Leipzig brethren, they struck in a body. The case would hardly call for comment were it not that patients are equally disaffected. The system oppresses them. They must take such physician as is allotted to them, and must buy their medicines at certain pharmacies, or lose the benefit of their subscription. They receive underpaid treatment grudgingly given, which is the worst treatment. They possibly lose more in equanimity than they gain in economy. While it is possible that some reform of the system may be secured, it looks very much as though its defects were radical. Organization fails when it clashes with human nature, and it is hard to see how any bureau system is consistent with the human relation that should exist between physician and patient.

Obituary.—Dr. Irving C. Rosse, a well-known physician and surgeon of Washington, D. C., died there last Friday of hydatid obstruction. He was fifty-four years old. He was a specialist in mental diseases, author of several

medical books and was a witness in the Guiteau and other famous trials.

Dr. Samuel Kuypers Lyon, who died in New York on Saturday, was born August 24, 1841, in that city. He was graduated in 1860 from Columbia College, and studied medicine under Dr. Willard Parker. He was graduated from the College of Physicians and Surgeons in 1866, serving sixteen months as junior and senior in the New York Hospital. He was appointed Attending Physician of the Heart and Lung Department of the New York Dispensary. He was a member of the County Medical Society, the Academy of Medicine, the Alumni of Columbia College, and the St. Nicholas Society.

Dr. George C. Jarvis, Surgeon of the Seventh Connecticut Regiment throughout the Civil War, and for many years a consulting physician of the Hartford Hospital, died Tuesday at Hartford, Conn., of pneumonia. He was sixty-seven years old.

American Hospitals in Pekin.—An English correspondent to the *British Medical Journal*, April 13th, comments in a manner very pleasant to Americans on the United States Hospital service at Pekin: "One fact which is realised as soon as one enters the hospital is that the medical arrangements in the American army possess a far higher degree of importance than in our own. The hospitals are not only given the best sites available, as is assumed to be the case in our army, but the amount of skilled labour supplied for employment under the direction of the chief medical officer is as unstinted as the funds placed at his disposal. Combatant officers good humouredly complained that (it's no use trying to get a nail knocked in anywhere else until the hospital is finished.) It was a surprise to most of us to find that every single American soldier on active service has a folding bedstead issued to him, no matter what his rank may be. His diet on active service contains luxuries and delicacies the names of which are scarcely known in our Commissariat Department—personally, I think our Commissariat are to be congratulated, for the diet of our soldiers is in my opinion superior in nearly every way to that of the American army, and more suited to the requirements of a campaign—but it is not till the American soldier goes to hospital that he is really in a position to appreciate how much his Government loves him. I do not think it would be a serious exaggeration to say that the American Hospital in Pekin could hold its own in every respect with most London hospitals. Bedsteads, bedside tables and chairs, brought from America, a 'diet kitchen' at the end of the ward, with an ample cooking range and a highly-trained cook in a white apron and cap, whose life's business is cooking, and who is not expected to do anything else. He is not an enlisted soldier, and he may not know one end of a rifle from another, but he can turn out any known delicacy that ever tempted the ap-

petite of a worn-out patient. I lay stress on this, as indeed any one would who saw those business-like diet kitchens and cooks with a lavish supply of all the apparatus, materials, and paraphernalia that a *chef* could desire. The difficulty of supplying really good food to the sick on active service is a great one, but the American Government, by simply recognising this fact, and by making an extra outlay to meet the difficulty, in a large measure overcomes it."

CORRESPONDENCE.

OUR LONDON LETTER.

[From Our Special Correspondent.]

LONDON, April 27th, 1901.

THE SOUTH AFRICAN WAR—A METEORIC SHOWER OF HONORS—THE STAR-SPANGLED PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS—THE COST OF THE CONSULTING SURGEONS TO THE FORCES—A SLIGHT ON THE DIRECTOR GENERAL OF THE ARMY MEDICAL SERVICE—THE ORDER OF THE BOOT—LORD ROBERTS AND THE ARMY DOCTORS—DEATH OF A MEDICAL M. P.

THE great event of the week here has been the distribution of honors for service in the South African war. The *London Gazette* (which is the official channel for the publication of such intelligence) appeared on the evening of April 19th, and the list of those whom the King delighteth to honor on this occasion extends over thirteen pages. I say "on this occasion" because the end is not yet. The present list includes only the honors given for services rendered when Lord Roberts gave up the supreme command of our forces in South Africa. There are more to come when Lord Kitchener sends in his account. In the meantime we have hardly recovered from the dazzling effect of the meteoric shower of crosses, stars and flamboyant ribbons which have lit up the normal dulness of the British sky. At will soon be almost a distinction here, as it was in the case of Lord Castlereagh amid the multi-decorated diplomatists at the Congress of Vienna, not to have an order or a title of some kind. At a time when there was an epidemic of Royal Commissions, Sydney Smith said that on any given citizen there lay the *onus probandi* that he was not a Commissioner. At present you can hardly meet a man in the street who is not a C.B. or a C.M.G.

The medical profession has got its share of decorations which like the rain have fallen on the just and on the unjust, for it must be admitted that some of the distinctions must be regarded either as sops to some Cerberus, colonial or other, than as rewards of merit. But on the whole they have been well earned. There are cases in which the recognition seems scanty. Sir William MacCormac, who was expected to get a peerage, has to be content with a K.C.B.

(Knight Commander of the Bath), a superfluous distinction as it only carries with it a title which he already had. It does, indeed, add a decoration to the many others which makes the President of the Royal College of Surgeons when in full war-paint more star-spangled than the American flag. He is a man of fine presence and his manly bosom offers an expanse for the use of which enterprising advertisers would doubtless pay fabulous sums. But he already must find it difficult to find room on it for his decorations, and if he gets many more, he will have to hang some of them on his back. A sandwich-man with decorations instead of boards—that would indeed be an advertisement of royal favor more striking than being clad in the royal apparel and riding the King's horse!

Apart from his amiable weakness for titles and decorations, Sir William MacCormac is a most worthy man. If he is not a great surgeon he has done the work that has come to his hand faithfully and well. He stands high in the favor of the sovereign. At St. Thomas's Hospital where he was long the ruling spirit he was respected by his colleagues and liked by the students. He is popular with the profession and in spite of the honors which have fallen to him, he has no enemies—partly perhaps because he is not feared as a rival. In fact, though his name has always been much in the mouths of men, he has never had a great practice. He is rich and has no family and has therefore been able to pursue his policy of "peace with honors," free from the disturbing influence of sordid cares.

The other eminent men who went out to the seat of war as Consulting Surgeons to the Forces have to be content with the C.B. (Companion of the Bath). In this batch of surgeons of world-wide reputation like Frederick Treves and William Watson Cheyne are lumped together with promising young men whose names were before the war altogether unknown to fame. They had the wit to take at the flood the tide which leads on to fortune, and they have their reward. They did excellent work, though it may be doubted whether their services were worth the remuneration, at the rate of \$25,000 a year, granted them by a grateful country. The sending out of consulting surgeons was in the first instance due to the pressure brought to bear on the War Office by influential persons who distrusted the professional capacity of the ordinary army doctor, and were anxious that the "curled darlings" of the Guards and other crack regiments in whom they were interested who might have the mischance to get a Boer bullet lodged in their dainty persons should have the best surgical craftsmen to heal their wounds. Then a generous rivalry sprang up among our surgeons, who all wished to place their knives at the disposal of their country. National susceptibilities had also to be soothed, as Scotland and Ireland were protesting against England being the favored nation. The end of the matter was that seven consulting surgeons were sent out at the

public expense, besides a number of volunteers. It is by no means clear that this galaxy of surgical talent has done much more for the wounded soldiers than could have been accomplished by the medical officers of the Army; and it is thought by some who are in a position to know the facts that the vast sum of money spent in rewarding the patriotic services of the consulting surgeons would have been expended to much better purpose in improving the efficiency of the Royal Army Medical Corps.

The army doctors have had a tolerable share of distinctions, but there is great dissatisfaction at the pointed omission of the name of the Director-General of the Service from the list. The reason doubtless is that the medical organization of the campaign has been fiercely criticized by Mr. Burdett Coutts and others. The Royal Commission on South African Hospitals found that in no previous war had the medical arrangements been so good, and the credit of these arrangements belongs mainly to Surgeon-General Jameson whose reward is to have what is nothing less than a public affront put upon him by the War Office. Our present Secretary of State for War, Mr. Brodrick, poses as a strong man, and he is believed to have for some reason or other, a feeling of hostility towards the medical service. He has dealt very severely with some medical officers of high rank whom he holds responsible for the hospital "scandals" which gave notoriety-seeking critics a handle. Two or three medical Colonels have, it is understood, received instead of the C.B., the "Order of the Boot," and have besides had the pensions to which in the ordinary course they would have been entitled on retirement docked to the amount of 20 per cent. It is whispered that Mr. Brodrick was with difficulty restrained from "breaking" one distinguished officer. All this is creating a feeling of unrest and fear for the future among our army doctors.

It is noted that although Lord Roberts mentions several individual officers with commendation he has no word of praise for the R.A.M.C. as a whole. This is all the more remarkable from the lavish display of eulogistic epithets that he makes in referring to every other branch of the army. Here too may be traced the effect of the violent and too often unscrupulous attacks that have been made on the medical service. By the way, Lord Roberts has been publicly claimed by the homeopathic sect as one of their scientific, or rather unscientific, persuasion. I do not mention this as having any particular bearing on the subject, but as a matter of some psychological interest.

Dr. Tanner who was referred to in a recent letter as one of the medical Members of Parliament has since died. His case was so hopeless when I wrote that, but for the decencies of journalism, he might have been spoken of in the aorist tense. One of our lighter poets, Praed, who was also a Member of Parliament, said that he found our grave legislators "but Eton boys

grown heavy." Of Dr. Tanner it may be said that to the end of his life he was but a medical student grown heavy. His voice was often enough heard in Parliament, it is true; but it was in cockcrow and bawling out insolent interruptions. On one occasion when the Speaker, for some high constitutional reason or other, left the Chair, Dr. Tanner deposited himself therein, to the horror of the stolid Britons present, and to the scandal even of the Irish Members who did not care to see their cause disgraced by horse-play. As a representative of the medical profession in the House of Commons, Dr. Tanner was worse than useless, for unlike his countryman, Goldsmith, he disadorned whatever he touched. He is said by those who knew him to have had a warm heart, but, unfortunately, he had a head which was not only hot but empty.

SOCIETY PROCEEDINGS.

AMERICAN SURGICAL ASSOCIATION.

Annual Meeting, Held at Baltimore, Md., May 7, 8, and 9th, 1901.

FIRST DAY—MAY 7TH.

The Cancer Problem.—At the close of the Executive Session and after the introduction of Mr. Mayo Robson, F.R.C.S., of Leeds, England, the President, Dr. Roswell Park, of Buffalo, delivered his Address. It was, in considerable measure, a repetition of Dr. Gaylord's recently published paper. In very generous criticism of the methods employed by earlier investigators, Dr. Park emphasized the coördinate importance of anti- and postmortem examinations. Each of these seem to point with equal clearness not alone to the infectious, but to the parasitic character of the neoplastic infection. At present there are three leading theories as to the etiology of cancer. Each one is championed by a nation, to the French it is a protozoon; to the Italians, a yeast; to the German, a cellular degeneration. It has been said that the long duration of the period of infection is a bar to the acceptance of the parasite theory. This seems groundless. In the New York State Laboratory was first firmly established the fact that a disentanglement of the complex problems enshrouding the etiology of neoplastic growth could be reached only through the combined efforts of biological and chemical methods of investigation. By this marshaling of their forces, Dr. Park and his colleagues concluded that the parasite is a protozoon, although as yet it is not as positively proven as it doubtless will be in the near future. Another point gained relates to the ultimate cause of death. Their chemico-biological researches prove this to be due to what he calls a "terminal infection"; a toxemia; a hematogenous infection.

Polymorphism of Parasite.—Of special in-

terest and import is the polymorphic character of the parasite. Suspended in a hanging drop on a warm stage these varied changes can be watched until a terminal state is reached which closely simulates sporulation. Another point to which the President directed attention is the extraordinary increase of the organisms at the time of death and the ease with which, at this moment, they may be demonstrated in the blood. What of the yeasts, and the cancers produced with them by Sanfelice? In all justice it must be said that this careful Italian, without doubt produced malignant growths by the yeast organisms, but Park feels that his percentage of successes were in no way comparable to those obtained at Buffalo, where, out of 14 guinea-pigs injected with parasites from human source, death ensued in all within fifty days; injections with organisms which had once killed a guinea-pig death resulted in twenty-five days. These injections are bacteriologically sterile; they show the organisms to be capable of an increase of virulence.

In concluding Dr. Park drew attention to the similarity between carcinoma and tuberculosis. Each begins locally; each kills by becoming general; early operation may save life in each. Sarcoma and carcinoma are due to different varieties of the same organism. Just as we now recognize three types of the malarial parasite, doubtless as many, or more exist of the parasite of neoplastic growths. Spontaneous retrocession of malignant development is probable, and is in no way incompatible with the protozoon theory of this disease.

Early Signs of Carcinoma of the Uterus.—In a highly interesting extemporaneous talk, Dr. Thomas S. Cullen of Baltimore discussed the methods employed at the Johns Hopkins Hospital of establishing an early diagnosis of uterine carcinoma by the investigation of curette scrapings. He called attention to the three varieties of uterine epithelium each of which gives rise to its special form of carcinoma, and stated that the presence of large, coal-black cells in otherwise normal epithelium were pathognomonic of malignancy. His remarks were illustrated by a series of beautiful microphotographical lantern-slides.

Brief Considerations of Cancer of the Breast Treated at the Johns Hopkins Hospital Since 1889.—Dr. W. S. Halsted of Baltimore declared that the differences existing between the closely allied neoplastic growths are so subtle as to elude the most painstaking artist, nevertheless he is trying to get pictures which will show the different forms. Of 320 cases of cancer of the breast, of which 150 are not yet three years old and which he therefore excludes, he presented an interesting series of tables. In 450 cases of breast tumors he found but three to be sarcomata, one primary; one secondary to the tonsil, and one to the uterus.

His malignant cases he tabulated as follows: Class I., cervical and axillary glands removed at first operation; class II., axillary glands removed at first operation; cervical at second; class III., cervical glands not removed.

His results were as follows: Class I., local recurrence in 11 per cent.; class II., local recurrence in 20 per cent.; class III., local recurrence in 9 per cent.

His cured cases present the following percentages: Class I., 45 per cent.; class II., 33 per cent.; class III., 43 per cent.

Late Results in Inoperable Sarcoma Treated with the Mixed Toxins.—As to the preparation of the injection fluid, Dr. Wm. B. Coley of New York had nothing new to suggest. It now seems to have reached a certain degree of perfection in that it is practically without danger, if properly used, to any except profoundly prostrated cases. If, in sarcoma—and there seems little indication for its use in carcinoma—there is no evidence of improvement at the end of three or four weeks the case may well be considered hopeless. Recent statistics compiled from the observations of many investigators, combined with his own, give the following percentages of cures: Round-cell sarcoma, 3-4 per cent.; spindle-cell, 50 per cent. The results are *nil* in melanotic and lymphosarcomata. Dr. Coley drew the following conclusions: The mixed toxins should be injected as prophylactic in every case of post-operative sarcoma. The treatment is rarely curative in carcinoma. The parasitic theory of malignancy is supported by the behavior of cases injected with the toxins.

Influence of Mental Depression on the Development of Malignant Disease.—In an interesting and instructive recess from the present, Dr. Joseph D. Bryant of New York traced the history of cancer from its earliest cradling by the Grecian observers to the most ultimate modern views. The Greek, with characteristic power of insight, plead rather for a physical than a mental cause in the etiology of cancer. In the darkness of the subsequent ages nothing is heard, until, with the awakening of learning, Ambrose Paré (1510) states "anger makes cancer more fierce and raging." Later, Sir Astley Cooper championed the psychopathic theory warmly and, while Velpeau denied it, Virchow and Rokitsanski admitted it, with certain qualifications. Napoleon and Grant—each the victim of extreme mental depression—may have been examples of Paré's theory. These and other conditions led Dr. Bryant to look into the matter from a statistical standpoint. From a careful perusal of the death records of England, Scotland, Wales, Paris and New York, as to the relation which mental depression, as best exemplified in melancholia, he reaches the following conclusions: Of 4,458 insane cases 402 females and 343 males were melan-

cholic; one male and four females had cancer. This shows a percentage of less than one. Out of over two million general deaths 3 died of cancer, males, 4.73 per cent.; females, 8.18 per cent., the ratio here being almost double and the average being 6.42 per cent. Thus it appears that malignancy is six times as frequent in the general community as among melancholics. Moreover, at Ward's Island $\frac{1}{25}$ per cent. of female melancholics are afflicted with cancer, while the rate rises to $\frac{1}{2}$ per cent. in other forms of insanity. It appears, therefore, that if in melancholia, which typifies the limit of mental prostration, malignant disease is so rare, the belief that psychopathic factors play any etiological part in this dyscrasia is doubtless without foundation.

Dr. J. Collins Warren of Boston, in opening the discussion appreciated the extreme difficulty of approaching so unknown and subtle a question. He felt greatly encouraged at the wonderful display of scientific life which is taking form the country over, in the erection of laboratories devoted exclusively to the study of malignant disease. Especially he wished to compliment the New York State Legislature for their generosity in this regard. He cordially agreed with Dr. Park, in that cancer is no doubt infectious, but he called attention to the fact that, as yet, Koch's laws have not yet been applied to the supposed protozoon. He pointed out that most of the experimental work has been accomplished by inoculation. Danger lies in this, that it may constitute a sort of grafting process: an artificial metastasis. The culture of the protozoon at Harvard has so far been negative. When inoculation results have been positive, has the fluid in every way been safeguarded against contamination? The blastomycetes have recently been beautifully demonstrated by Plimmer, and there is no doubt that they have produced granular connective tissue growths. He feels assured that primary and secondary cancers may disappear, this due to the fact that occasionally katabolism and its accompanying degenerations may exceed anabolism. As a means of more intelligently discussing the results of operations on the breast he suggests the division of these cases into three classes, (a) favorable, (b) unfavorable, (c) palliative. While admitting that Coley's fluid had proved negative in the hands of most operators, he urged the continuance of its use and the encouragement of a treatment which afforded to the hopeless even a single ray of light.

Dr. Thomas S. Cullen of Baltimore in discussion said that although the statements of Drs. Park and Gaylord were very alluring and despite the fact of his having seen some of the latter's most exquisite slides, there yet remains much to be said and done ere the protozoon theory can be considered established.

In closing the discussion, Dr. Park, with characteristic diffidence, admitted the poignancy of these criticisms, but felt certain that within a

short time they would all be happily disproved.

Blood Examination as an Aid to Surgical Diagnosis.—Dr. J. C. Bloodgood of Baltimore asked and answered the following interesting questions: Does the blood afford any constant variation in any of its factors which can be of use in diagnosing the complication of intestinal rupture in severe abdominal contusions? If this exist, it has not, as yet, been discovered. Another problem upon which the blood again throws no light is the differentiation between shock and internal hemorrhage. From the blood, however, we do obtain a very sure contra-indication to operations which are not imperatively called for this is a low hemoglobin reading. Fifty per cent. or less should in this class of cases contra-indicate the operation until, by the administration of certain drugs, it can be brought more nearly to the normal. Of special interest were his remarks on post-operative leucocytosis; this he considers a positively assured fact. While leucocytosis also occurs with invariable certainty in intestinal obstruction and peritonitis, in the former it is of the profoundest value because life can almost always be saved by early operation. This of course is not true of peritonitis. In concluding he admitted that even a very high degree of leucocytosis is not *per se* pathognomonic. It is, however, at least as important as T.P.R. and may justly be considered to be of greater value than any one of the three. A leucocytosis exceeding 20,000 twenty hours after the onset of an attack constitutes a faithful guide to prompt operation no matter what may be the clinical symptoms.

Clinical Value of Blood Examinations in Appendicitis.—Dr. J. C. Da Costa, Jr., of Philadelphia presented a report of 118 cases upon which he had operated. He felt that a simple classification always afforded clearness, and he therefore divided his cases into two types, namely, (1) non-purulent, simple and catarrhal; (2) purulent, with or without gangrene and peritonitis. In all but 38 cases there was pus. The hemoglobin averaged about 70 per cent. in the 118 cases; in Class 2 it occasionally fell to 30 per cent. The red cells are usually present in about normal number in both classes. This is not in accord with the accepted belief. Although in some isolated cases the color index has actually approached that found in pernicious anemia, it averages .82. Whatever variations and irregularities may exist, the leucocytosis is constant in Class 2—the only factors which can interfere with this manifestation being the so-called “walling off” and, though very rarely, extreme exhaustion. Dr. DaCosta summed up as follows: (1) The hemoglobin reading in the average case averages about 70 per cent.; erythrocytes, 4,500,000. Profound anemia may contra-indicate operation. (2) There is a moderate leucocytosis with or without pus. (3) A leucocytosis below 20,000 does not call for operation. (4) A leucocytosis of 20,000 or more occurring within twenty hours of the first attack indicates pus and

immediate operation. (5) Failure of the leucocytes to return to normal after operation indicates the probable presence of pus pockets.

Blood Examination in Relation to Surgical Diagnosis.—Dr. J. B. Blake of Boston, on behalf of himself and his two collaborators, Drs. J. C. Hubbard and R. C. Cabot of Boston, said that after a series of experiments, conducted with a view of determining the presence or absence of an ether leucocytosis, they had decided that it rarely, if ever, existed. Thirty-six hours after operation, all post-operative leucocytosis has vanished. In uncomplicated fractures the count rarely exceeds 12,000. A singular fact established by that series of experiments is the hemoglobin gain after neoplastic excisions, this being contrary to the accepted belief. The prognostication of typhoid perforation remains still in the dark, the so-called “wave” being of no significance. The hemic changes following prolonged, violent, muscular exercise bear an interesting relation to certain forms of disease; the runners in the so-called Marathon races developed counts of over 20,000; the polymorphonuclear cells increased 75 per cent. to 90 per cent.; the eosinophiles were absent, the lymphocytes diminished. These last observations were made in the hope that the runners would present hemic conditions which might throw some light on shock, since their profound depression seemed to simulate this condition, but such was not the case.

Effect on the Blood of Ether Used as an Anesthetic.—D. J. Chalmers Da Costa of Philadelphia said that no possible exception could be taken to his conclusions because of the care he had used in the preparation of the patients who had furnished the data for this report. By purgation and diaphoresis he had approximated them to the condition of the average operation case. Ether increases the number of the erythrocytes, diminishes the hemoglobin and reduces the color index. The hemolytic function is increased. He feels operation to be contra-indicated below 40 per cent. of hemoglobin, unless life be imperiled by the delay. In the presence of any anemia the routine purgation should be avoided or made as light as possible.

Examination of the Blood in Relation to Surgery of Scientific Value, but too Often of No Practical Value.—Dr. John B. Deaver of Philadelphia, with characteristic energy, affirmed that blood-counts, hematocrits, and so on, had taken altogether too prominent a place in surgery and were displacing bedside observations. He considered it absurd that any degree of anemia should stand in the way of a needed operation and said that he had never found any danger arising from anesthetizing and operating upon profoundly anemic patients.

In the discussion of these papers Dr. B. F. Curtis of New York said he was at a loss to interpret the reports from Boston. In his service at St. Luke's Hospital a great number of counts had been made with a view to establishing the

degree of leucocytosis which exists during ether anesthetization and he had considered it definitely proven that the count is always high irrespective of the patient's condition or the character of the operation. Intraspinal anesthesia yields a progressive increase in from one to five hours. He has considered post-operative leucocytosis so fixed a factor as to believe it seriously interferes with any prognosis of wound infection which might otherwise be gained through the hemoc count.

(To be Continued)

ASSOCIATION OF AMERICAN PHYSICIANS.

Sixteenth Annual Meeting, Held at Washington, D. C., April 30 and May 1 and 2, 1901.

(Concluded from Page 743.)

SECOND DAY—MAY 1ST.

THE nominees of the first day were all elected.

Clinical Features of Bubonic Plague.—Dr. L. F. Barker of Chicago gave a résumé of the clinical features observed by him in the plague cases at San Francisco. The disease is primarily a septicemia and may show a general sepsis without any local lesions; in the more resistant cases there may be only a local reaction and no marked general reaction. The San Francisco cases were not peculiar; they were identical with cases seen in other epidemics, resembling notably those observed in the beginning of a general epidemic. The type is a "sneaking" type, as was reported in the Bombay and Hong-kong epidemics before the great outbreak in those places. Thus far, in San Francisco few rats have been found to have the disease. While only 31 cases have been reported from San Francisco it is highly probable that more than this number have been attacked. Certain minor differences in age at onset and in the matter of sex were observed, but these were due purely to local conditions.

Type of Disease.—In San Francisco the type of the disease thus far has been truly bubonic, one case of primary septicemia and one of pulmonary invasion alone being reported. Should the disease become more prevalent other types will probably appear, but this is not now probable in view of the arrangement for sanitary control now provided.

Clinical Features.—The disease is usually ushered in by a chill and a rapid rise in temperature which may intermit and become irregular. Anorexia, nausea and vomiting, succeeded by delirium and coma are the symptoms in the acute severe cases. Within twenty-four hours a bubo appears and, the disease progressing, the patient may die on the fourth to sixth day. If the patient lives more than six days recovery is likely to occur. In those that persist for a number of weeks suppuration of the buboes occurs. The bubo affection is different from a simple lymphatic infection. It becomes very large, varying in size

from a hen's egg to that of a man's fist; sometimes at first the gland itself may be palpated, but the rapid increase, not of a single lymph-node, but of the entire glandular structures soon makes a swelling markedly different from anything else. There develops a rapid and marked edema which has a peculiar elastic quality and the whole swelling shows signs of hemorrhagic infiltration. The attitude of the patient is often pathognomonic. A position which relaxes the tissues about the swollen gland is adopted; the patient usually being drawn up, the knees lying close to the chest, especially if the groin is involved. This is the favorite site, the cervical is next. No cases of axillary bubo were observed in the San Francisco cases. Cervical buboes are often associated with enlarged tonsils. Dr. Barker made a distinction between primary buboes and secondary ones. He also spoke of the pulmonary type, the septicemic type, *pestis siderans* and the walking cases, *pestis minor*. These latter were important cases, as they were very common at the beginning and end of an epidemic, and were of particular importance when the problem of control was under consideration. The question of so-called *climatic buboes* was of importance as it was claimed by many that the Chinese suffered from such an affection. Dr. Baker thought it wise to consider these plague cases until they were proved not to be so.

Prophylaxis.—The diagnosis of the first case was all important and in order to make such a diagnosis a dead patient was as useful, if not more so than a live one. A bacterial examination is the prime requisite. The diagnosis, he thought, was an extremely simple one for a trained bacteriologist who had had some clinical experience with the plague.

Differential Diagnosis.—The most important diseases to exclude are malaria, where a research for the parasite suffices, although mixed cases do occur; in the early stages of typhoid it is very difficult to make the diagnosis; in relapsing fever the *spirillum* is sufficient; venereal buboes, not difficult, as they do not have the characteristic edema, hemorrhage nor great infiltration; anthrax, bacterial diagnosis suffices. In Mongolians, he thought it wise to consider every case of fever as plague until proven otherwise and that every cadaver should be examined by a trained bacteriologist. Finally, with reference to treatment, the Roux-Yersin serum should be used.

Bacteriology of Plague.—Dr. F. G. Novy of Ann Arbor said, with reference to the bacterial diagnosis, that frequently the bacteria could not be obtained from the living patient. A hypodermic might be plunged into a bubo and the fluid obtained examined, but this did not always give positive results. Direct examination of the blood more often gave negative results, but cultural experiments were usually positive. In the pulmonary form the diagnosis

was very simple as the bacillus was found in the sputum in large quantities. It might also be found in the urine and in splenic pulp. Animal experimentations were necessary and final as most animals, notably the rat, gave positive evidences of the disease within a very short time. The typical plague bacillus is a short, stout rod, occurring singly and showing a peculiar bipolar staining, when fresh; old and senile specimens showed many involution forms. Dr. Novy described in detail the case of accidental infection of one of the laboratory workers at Ann Arbor occasioned by infection from one of the organisms obtained from the San Francisco expedition. The case was of the pulmonary type and recovered after free use of the Roux-Yersin serum.

Pathology of Bubonic Plague.—Dr. Simon Flexner of Philadelphia described in detail the characteristic lesions observed in these same cases. He thought that the infection was largely a direct one and was spread in the body mainly through the lymphatics. He knew of no pathological condition which gave lesions which resembled those of the plague, hence a diagnosis of this disease might be made by a pathological examination alone. The glandular enlargement in the lymph-glands was due to a cell proliferation in the lymph-sinuses. The hemorrhage was excessive and characteristic; the edema was very prominent and was not confined to the lymphatic structures alone, but spread into the muscular tissues. The enormous growth of bacteria was marked; the organisms being numerous enough at times to cause thrombi in the lymph-sinuses, thereby causing obstruction to the flow of the lymphatics. This in part is responsible for the necrosis so frequently found. The pneumonia is usually of a lobular type, although by the merging of the lobules a pseudolobar pneumonia might result. Enlarged spleen, from vascular engorgement and an acute splenitis, is usually present. The bacteria may be thrown off from the skin, from suppurating buboes, from the sputum, from the buccal secretions, from the urine and from the feces. These excreta, therefore, should be disinfected.

In the discussion Surgeon-General Sternberg spoke of the debt that this country owed to the development of the study of bacteriology, inasmuch as had this disease occurred twenty years ago, it would in all probability have swept over the entire country.

Drs. Vaughan and Dock of Ann Arbor contributed some interesting details regarding the accidental case of laboratory plague already alluded to. Dr. Dock said that the Roux-Yersin serum probably saved the patient's life, as pulmonic-plague was usually fatal in every case.

Yellow Fever.—Drs. Walter Reed and James Carroll, U. S. A., reported some further details concerning the development of yellow

fever. It had seemed to them that at this time it was more important to determine the precise mode of communication of the disease than to search for the specific organism, and they brought forward additional evidence in favor of the mosquito theory of conveyance. They made conclusive experiments bearing on three suspected modes of contagions: (1) By means of contaminated mosquitoes, *Culex fasciatus*; (2) by means of inoculations of blood, and, (3) by exposure to intimate contact with clothing, dejecta, etc. In some further experiments they proved that the method of contagion by blood inoculations was positive, as was also that by the mosquito, but that simple contact with fomites was negative in every case.

Incubation Period.—In blood inoculations, as well as by mosquito bites, the period of incubation averaged between three and four days. It was interesting to note that mosquitoes infected by biting yellow-fever patients were capable of transmitting the disease as late as seventy-one days after their infection.

Dr. Sternberg thought that the demonstrations of Drs. Reed and Carroll had now solved the problem of the contagion of yellow fever and had cleared up many of the apparent contradictions concerning its etiology.

Dr. W. H. Welch commented on the fact that the real heroes of the Spanish-American war were the United States soldiers who had volunteered to run the risks of being inoculated with yellow fever. None of them had died yet the honor was theirs.

Malarial Nephritis.—Dr. James Ewing of New York reported an interesting case of hemorrhagic nephritis due to the accumulation of enormous masses of the estivo-autumnal type of malarial parasite in the kidney. Renal disease is often due to toxic products derived from these parasites, but in this instance the cause was held to be a mechanical one. These masses of infected red cells formed thrombi which produced renal infarcts which in turn determined the degeneration of the cortical tubules. He said that three types of malarial nephritis might be distinguished: (1) An acute degeneration due to the development of toxic substances; (2) an acute degeneration due to focal necrosis in the hemoglobinuric type of malaria, and (3) a degeneration due to the development of masses of parasites which by mechanical means alone produced thrombi and renal infarcts.

Septic Infection from Stomach and Intestines.—Dr. Walter B. James said that septic infection through the gastric and duodenal mucosa was considered rare, but that of late years he had come to believe it more common than was usually supposed. The bacterial flora of the stomach and duodenum was very extensive and many researches had shown that numerous organisms survived the ordinary digestive processes. It was not then improbable

that if a solution of continuity of the gastric or duodenal mucosa was present that septic infection might take place thereby. He reported several cases showing mild and severe septicemia in which erosions of these mucous membranes, adenoma, ulcer, etc., were the only indications *postmortem* of the possibility of accounting for the conditions. In discussing the subject of gastric ulcer he said that over 50 per cent. of his cases in the Presbyterian Hospital had hectic fever, probably due to absorption through the eroded mucous membrane.

Streptothrall Infections.—Dr. J. H. Musser of Philadelphia reported two cases; one an abscess of the brain and another a bronchitis and bronchopneumonia in which organisms closely resembling *streptothrix* had been found. One of the cases might be considered as one of tuberculosis, with the peculiar type of branched bacillus tuberculosis.

Chemistry of the Tubercle Bacillus.—Drs. E. L. Trudeau and P. A. Levene of Saranac Lake presented specimens of bodies isolated from the tubercle bacillus. These were (1) a coloring body, reddish in general tint and fluorescent; (2) wax-like body, probably present in a proportion of about 30 per cent. in the organism; (3) cellulose body resembling somewhat the peculiar fungus cellulose, reacting like chitin of insects elytra, lobster shell, etc.; (4) three nucleoproteids, one of which produced almost pure nucleic acid, and (5) glycogen.

Dr. Abbott commented on the fact that the mucinoid substances developed by *bacillus pyocyaneus* showed reactions closely resembling mucin and cellulose.

Dr. Vaughan described an enormous incubator devised by him to cultivate large quantities of bacteria in order to further their chemical study. This culture chamber had a growing surface of 20 square feet.

Urine as a Culture Medium.—Dr. W. H. Park of New York presented a paper bearing on the practical question of the urine as a medium for the cultivation of bacteria. He showed that the acidity of the normal healthy urine had a wide amplitude of variation and that within the limits of such acidity, the growth of most pathogenic bacteria was diminished or checked. Thus, within the limits of the normal acidity, the gonococcus could not be made to grow and that acid urines were not favorable to the growth of the colon and typhoid bacilli; nor to the proteus nor staphylococcus. He had observed that in some urines no bacteria would grow. The practical point brought out was that an increase in the acidity was inimical to the growth of most of the pathogenic organisms and that by an increase in the acidity of the urine an efficient means could be found to prevent infection. In this manner cystitis, pyelitis and pyelonephritis might be avoided.

Orchitis and Typhoid Fever.—Dr. F. P. Kinnicutt of New York spoke of this comparatively rare complication of typhoid fever. In an analysis of some 800 cases of typhoid treated at the Presbyterian Hospital he had noted the complication in but two instances. In one case the gland suppurated and the *bacillus typhosus* was found in the pus. In cases occurring some weeks after the recovery of the patient, it is not improbable that some other cause might be found. He made a résumé of the available literature and showed that in many cases the typhoid organism had been found either in the serum of the gland or in suppurative foci and it therefore seemed proved that the typhoid organism bore a direct relation to the orchitis. It is probable that the organisms reach the vas deferens by means of the blood channel. Thrombi occur, phlebitis develops and the orchitis thus has its origin. He concluded that orchitis was a rare complication of typhoid fever; it occurs late in the disease or during convalescence; it may be unilateral or bilateral and goes on to resolution, suppuration occurring in but 25 per cent.; local necrosis, however, of a portion of the testis is not uncommon, or the entire testicle may be destroyed; atrophy of the testicle may perhaps develop; there is little constitutional disturbance and death by reason of the accident is thus far unknown.

Treatment of Cancer by the Roentgen Rays.—Dr. F. H. Williams of Boston said that at the present time it was premature to draw any conclusions regarding the ultimate value that the X-ray might be found to have in the treatment of cancer. The present outlook, however, was very hopeful. In certain cases of flat epithelioma of the face, which were amenable to treatment by simple caustics, the burning action of the X-rays filled a similar office, and here could be considered merely as a caustic. In other cases, and these were those for which much is expected, the caustic action does not account for the benefit obtained. In a number of cases of flat epithelioma of the face, 11 being reported, the results were excellent. One case of epidermal cancer of the lips and a large flat epithelioma of the hand were reported and photographs shown, evidencing the value of the treatment.

Advantages and Disadvantages.—The safety of the method was spoken of. There was no pain, nor delay in the beginning of treatment, as is so frequently necessary in raising the tone of the patient to stand an operative shock; no burns are produced, the cosmetic effects are excellent; sometimes improvement once begun goes on to cure without continuous treatment; the patients can attend regularly to their work. Some of the disadvantages were the necessity of great care in the prevention of burns, the expense of the apparatus and the long-continued course of treatment necessary.

Osteitis Deformans.—Drs. F. A. Packard and J. Dutton Steele of Philadelphia reported a case of this rare disease. Comment was made of the fact that diagnosis during life was very difficult and that in view of the great lack of criteria by which the general subject of bony lesions was to be judged, they offered no theories regarding the probable nature of the affection.

Arthritis Deformans.—Dr. William Osler of Baltimore spoke of the obscurity concerning the etiology of this affection. Is it nervous? Does it belong to the peculiar unknown groups of para-bacillary diseases. Are there several distinct types of the affection? He spoke of three fairly well-marked clinical manifestations. One occurring in young children with enlarged spleens and involved lymph-nodes; another occurring in adults, with atrophic changes, and a third, also in adults, usually past middle life, with the development of ringbone, osteophytes, many of which are developed with great suddenness. At times the disease shows curious localizations, sometimes involving several joints, again only a few, symmetrically disposed joints. An acute onset, resembling rheumatism is not infrequent.

Spinal Column Cases.—He alluded to the interest manifested of late years in this type of cases, especially taken by neurologists. Two forms were considered in detail. In the Von Bechterew type there was great rigidity of the spinal column, with marked kyphosis, muscular atrophy. In addition there was a marked hereditary tendency, usually a history of injury, but most important there were symptoms, chiefly pain and other sensory disturbances, which pointed to an implication of the nerve-roots, just within the cord or the spinal processes. In a second type the Marie-Strümpell variety, there was the same spinal rigidity and kyphosis, and in addition a marked tendency on the part of the larger joints to become ankylosed. There are no root symptoms in this type. Dr. Osler was inclined to the belief that it was not necessary to suppose these to be different affections and due to disease of the nervous system; it was wiser not to dissociate them and to regard them essentially as joint lesions and to account for the root symptoms, in Von Bechterew's cases especially, on purely mechanical grounds.

Dr. F. Stockton of Buffalo and Dr. Lamb of Washington exhibited some skeletons showing characteristic lesions of this affection.

In the discussion Dr. B. Sachs of New York said that he coincided, in the main, with what Dr. Osler had said. He did not regard Von Bechterew as correct in his interpretation of the cause of the root symptoms.

Dr. Cabot said that acute destruction as seen in the atrophic cases and chronic production as seen in the larger number of cases,

should not be considered as different stages of the same pathological process; they were, in all probability different entities. He called attention to the great benefit that might be secured to such patients by the use of mechanical support. Many intractable cases, usually termed a mixture of lumbago and sciatica, are often cured by appropriate mechanical support.

Tropho-Neuroses and Vascular Diseases of the Extremities.—Dr. B. Sachs of New York said that in studying a case of erythromelalgia his attention had been called to the marked degeneration, with thickening, arteritis obliterans, of the blood-vessels of the affected area. This had led him to the proposition that perhaps many of the so-called tropho-neuroses might not be nervous in their origin, either as due to central nerve changes or as nerve end neuritides, but were possibly due to arterial changes. It was of much importance that a proper appreciation of the general condition of the blood-vessels should be kept in mind in the study of all cases supposed to belong to the class of tropho-neuroses. An investigation of the condition of the arteries of the lower extremities is of much value and is frequently overlooked.

Subcortical Glioma.—Dr. J. Stewart of Montreal gave a history in detail of a case which in its early phases presented attacks of disarthria and deaf mutism for periods of one-half hour or so. Headaches, twitching of the muscles of the face developed and at times numbness in the face and arms. Failing sight was also a symptom. With reference to the disarthria the labials were first affected. The symptoms developed progressively until complete anarthria was present. A slight grade of dysgraphia developed. There was no aphasia. It was diagnosed that the lesion was subcortical and on operation a normal cortex was found; beneath the lower part of the ascending frontal convolution a dense mass could be palpated and a firm encapsulated tumor, $1 \times \frac{3}{4}$ inch, was enucleated. This proved to be a glioma. The patient ultimately recovered.

Jacksonian Epilepsy.—Dr. James J. Putnam of Boston said that within recent years it had become for him a distinct query whether operation for the relief or cure of Jacksonian epilepsy was advisable. He asked if, in the first place, the operation was of any use? If cortical excision alone was sufficient, and, finally, how could the symptoms of epilepsy be explained by any theory of cortical action? In reply to the first question his answer was, yes, as the number of cases which the operation had benefited was too great to gainsay. It was a question, however, whether cortical excision alone was sufficient. In a number of instances he had observed that the simple opening of the skull or with excision of the dura had been sufficient to relieve the epileptic attacks, for a time at least. In such cases

suggestion thereby seemed the only applicable theory to apply. Dr. Putnam did not believe much in a cortical epileptic center.

In the discussion Dr. Sachs said that whereas a healthy conservatism had been manifest of late years with reference to this operation, nevertheless it was advisable to operate early in such cases. If the time was well chosen better results might be obtained.

Family Periodic Paralysis.—Drs. J. K. Mitchell, S. Flexner and D. L. Edsall of Philadelphia reported two cases of this affection in detail with a series of chemical and blood investigations made with a view to arrive at clearer ideas regarding its etiology. Animal experiments proved negative. No products toxic to guinea-pigs or rabbits were obtained either in the blood or in the urine. During an attack there was an increased alkalinity of the blood. Search for acetone, di-acetic acid, etc., was negative. The investigation of the amount of kreatin and kreatinin seemed to offer some light, as an increase in these products usually preceded the attacks. The disturbed metabolism took place largely in the affected muscles themselves. Citrate of potash had proven of some value in the therapy.

Heredity of Appendicitis.—Dr. F. Forstheimer of Cincinnati showed charts of three families in which a distinct family history of appendicitis could be shown for several generations. In many of the cases an attendant neurotic history was also manifest.

THIRD DAY—MAY 2D.

Diverticulum of the Esophagus.—Dr. F. Pfaff of Boston gave a series of observations concerning the process of digestion as a result of the investigation of the contents of an esophageal diverticulum. The patient learned to feed himself by means of the stomach-tube, but regurgitated all solid food taken by the mouth.

Action of Ptyalin on Digestion.—In the diverticulum it was shown that a certain percentage of starch digestion could go on. There was no pepsin nor HCl in the diverticulum. Within the stomach an entire absence of ptyalin had no adverse results on the digestive process. Its action could be dispensed with. Lactic acid could be found in the diverticulum if there was bacterial action, but in the absence of such this acid did not develop. Absorption from the walls of the diverticulum was *nil*. The amount of modification of the epithelium should be considered a factor nevertheless.

Early Recognition of Tuberculosis.—Dr. E. L. Trudeau of Saranac Lake said that much of the lack of success in the sanatorium treatment of tuberculosis was due to the fact that the patients were sent there too late in the disease. It was very plain to him that in the distinctly incipient stages, the disease was

curable by the sanatorium method, but that his experience bore out that of others working in similar fields, that the great majority of the cases came when advanced inroads had been made by the tuberculous process. The most important factor, he thought, was that of early diagnosis, and much of the time spent on useless methods, such as counting bacteria, might better be spent in perfecting one's self in the art of diagnosis, especially with the view to the discovery of the initial onset. In veiled cases he advocated the use of the tuberculin reaction.

Burns.—Drs. J. G. Adami and J. McCrae of Montreal read a paper on this subject. They found that the pathological changes, especially in the lymphatics, resembled very closely those found after death by the bacterial toxins, diphtheria, for instance, and they were led to consider that the cause of death in extensive burns might be due to some form of toxemia, possibly hemic in its origin. This toxemia is probably chemical in its nature and affects other organs of the body, notably the kidneys, in which an acute degenerative nephritis is set up.

Hemolysis.—Dr. S. J. Meltzer of New York read a paper on this subject. He discussed in full the subjects of immunity and agglutination, from the analogous standpoint of hemolysis. It has been shown that the effects of the blood of an animal of one species had a marked effect on the red corpuscles of another species. This was first learned when animal blood transfusions were practised. In practise this phenomenon has been widely studied and shows many analogies to the action of sera on bacterial bodies. There are certain natural poisons for red blood-cells; they contain hemolytic substances; thus, eel's serum is very markedly destructive to the red cells of the rabbit. By repeated vaccination, however, the rabbit's blood may acquire antitoxic powers which will ultimately protect the red cells from the hemolysins of the eel's serum. Dr. Meltzer's studies were principally along the line of introducing heterologous blood sera into the peritoneal cavity of other animals, whereby the antitoxic properties were developed. The subject is a new one and requires many more observations to permit generalizations.

MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK.

Stated Meeting, Held April 8, 1901.

J. Blake White, M.D., Chairman for the Borough of Manhattan, Presiding.

Food as a Factor in the Causation of Disease.—Dr. Elmer Lee read a paper on this subject. The science of living, he said, begins at the mouth. As a man eats and digests his food, so is he. Disease is latent in every man,

and at all times. Food is both the saving and the undoing of health. Food, rightly used, means health and strength. Neglect to feed the body safely is the starting-point in pathology. The universality of sickness, suffering and premature death requires a universal cause for their explanation. The habit of letting into the system unprepared and unsafe nutriment is the only admissible solution. Theories have long been put out to explain the riddle, but have ever remained theories. In the extreme urgency to satisfy the demand for an answer to the question, plausible hypotheses have grown up. The germ theory is the one most prominent at this time, but it is incomplete and unsatisfactory, for it cannot account for the germ itself.

There is one health, and that condition which is not health is disease. Any departure from perfect health and economy of vital action is a first stage of disease. Every variation from the normal state is a degree. Sickness is composed of many degrees. The words "slight," "serious," "dangerous" and "fatal" are terms representing different states or degrees of disease. But in each instance disease is a backward process, while health is progressive. Inaction and retarded action within the body are the beginnings of disease from the misuse of food. As food enters into the substance of man, so is it his health or the opposite. All systems of medicine amount to nothing unless founded on what is carried within the human body as essential nutriment to its growth and life. The right uses of food build for health and vigor and preclude disease. Each physician should apply the test of sound and continuous health to himself as the measure of his scientific knowledge of human vital action. Sound and continuous health is the sequence of habitual living by knowledge and not by chance.

Statements of the Paper Too Sweeping.—Dr. Ransford E. Van Gieson thought that all must acknowledge that the improper selection and preparation of food and imperfect mastication are undoubtedly responsible for a large amount of ill health. Man is more or less an animal, but his instincts do not always guide him correctly, as in the case of the lower animals. Doubtless the broad ground taken by Dr. Lee is measurably true, and it is a matter of observation that the physician who is most successful is he who takes the greatest pains to instruct his patients in regard to their diet and the proper manner of taking it. But, at the same time, Dr. Van Gieson said, he was not prepared to accept in its totality the theory as to the universal causation of disease set forth in the paper. He would especially take exception as regards the etiology of epidemic disease. Like most medical practitioners, as they grew older, he had come to entertain doubts as to the universality of germ pathology, but still he could not but believe that there

are certain forms of epidemic disease the origin of which is explainable on no other hypothesis. Take, for instance, influenza, which sweeps rapidly over a community and strikes down not only the weak, but the strong and those who are in perfect health.

Necessity of Complete Mastication.—Within the past two weeks he had found it necessary no less than fifty times to urge the advice, *eat slowly*, in cases of various forms of indigestion presenting themselves in his practice. If such patients told him that they were obliged to eat their meals hurriedly he instructed them that it was much better to go without eating at all until they could get time to eat properly. It was unfortunately true that most of us were apt, in our busy practice, to lose sight of the elementary truth regarding this most important subject.

Every Physician Should Be a Good Cook.—Every practitioner should know practically how to cook. Even the best trained nurses were often woefully ignorant on this matter, and the medical attendant should always be ready to give exact instructions as to the proper preparation of diet, and, if need be, to prepare it himself.

Various Forms of Disease Caused by Special Kinds of Food.—Dr. Edward Quintard said that one good reason why the teachings of Hippocrates still survived and were still held in such high esteem was because they were characterized by such strong common sense. On the present occasion he would not attempt any theorizing, but would briefly relate a few instances coming under his personal observation in which special varieties of disease were produced by particular articles of diet. Having spoken of the eczematous-like eruption caused by oatmeal, he said that he had met with three cases in which the eating of salted almonds resulted in the production of peculiar little ulcers of the tongue. He had frequently observed that the free use of sweets and pastry gave rise to a peculiar form of gastritis accompanied by hyperacidity. In subjects with a tendency to affections of the mucous membranes highly-seasoned foods were also very apt to produce gastritis. From cases he had observed he was inclined to the opinion that in chlorotic girls, much given to the use of sweets and suffering from hyperacidity, such food is sometimes the cause of gastric ulcer. There is a peculiar form of diarrhea, almost dysenteric in character and coming on almost immediately after meals, which is due to an inordinate amount of fluid taken with the meals. This had the effect of diluting the gastric juice to such an extent that it could not properly perform its function, and increased peristalsis was caused by the irritation thus set up in the intestine.

Bacteriology Not Ignored.—Dr. C. N. B. Cammack said that Dr. Lee's ideas were far from being out of accord with the results of

bacteriological research. It was because of a loss of nutrition in some part of the body that the disease germs were enabled to get a foothold. Thus, pernicious anemia was caused by a gradual failure of resistance on the part of the digestive tract to the onset of micro-organisms having a destructive action upon the blood.

Not Safe to Generalize Too Much.—Dr. A. Rose thought there was a danger in generalizing too much. He had known of patients who, under a carefully-regulated diet prescribed by stomach specialists, had continued to suffer greatly, but who, when allowed to eat everything they wanted to, immediately got well. We should not forget that what is satisfactory in the case of one individual may be dangerous to another. Gerhardt had pointed out that many of the late hemorrhages in typhoid fever were due, not to typhoid ulcerations in the intestine, but to a form of scurvy resulting from an exclusive milk diet. He therefore advised that typhoid patients should be given more or less vegetable food, such as spinach, watercress, and the like.

CHICAGO PATHOLOGICAL SOCIETY.

Stated Meeting, Held April 8, 1901.

The President, L. Hektoen, M.D., in the Chair.

Varicose Veins of the Right Upper Extremity in a Child.—Dr. Bertha E. Bush reported this case, placing on record a developmental varix, in a young child, the process affecting the anterior superficial veins of the entire right hand, arm and shoulder. Numerous saccular dilatations occur just beneath the skin, those at the inner end of the clavicle and in the palm of the hand being the most conspicuous. Skiagraphs show deformity of the right metacarpal bones, and generally diminished growth of the arm and hand. There is no pulsation nor edema, and no history of hemorrhage. Noteworthy points in the case are: (1) The congenital origin; (2) the region involved; (3) the obscure etiology, and (4) the scarcity of literature.

Blastomycetic (Oidiomycetic) Dermatitis.—Dr. H. T. Ricketts presented a consideration of this condition, with demonstrations. Through the courtesies from Professors Hyde, Montgomery and Hektoen, he had studied the pathological and mycological features of ten new cases of blastomycetic (oidiomycetic) dermatitis observed during the last eighteen months, mostly in the clinic of Professors Hyde and Montgomery. The work was done in the Pathological Laboratory of Rush Medical College. There is a clinical history in all cases; the process beginning as a pustule, which becomes a larger ulcer, the surface later being covered with coarse papillæ bathed in pus. A reddish areola containing miliary abscesses

surrounds the verrucose tissue; the center of the lesion cicatrizes as the periphery extends.

The histological features are uniform; carcinomatoid proliferation, and leucocytic infiltration of the epithelium, intra-epithelial abscesses, premature and abnormal cornification, peculiar retrogressive epithelial changes and epithelial giant cells, and in the corium, dense leucocytic and plasma-cell infiltration, fixed tissue proliferation, subcutaneous abscesses, giant cells and tubercles, resembling those of tuberculosis, but being less typical in the inter-relationship of cells and showing less advanced regressive changes. Plasma-cells seek the periphery of the process. Apparently there is an eosinophilous type of the disease, which, in the cases studied, is associated with a mold-fungus form of the parasite, and very large papillæ. Russel's fuchsin bodies are found in plasma-cells and intercellular spaces. There is a close relationship between plasma-cells and the formation of a peripheral protective zone of fibrous tissue. They do not appear to become fibroblasts, but to undergo a gradual disintegration as provender for forming fibrous tissue. Mast-cells exist in large numbers, and are classified as (1) leucocytic; (2) connective tissue cell type; (3) those possessing halos; and, (4) the plasma-mast-cell type. In the tissue the organisms are found singly, in budding pairs and in groups, in intra-epithelial and subcutaneous abscesses, free between healthy rete cells, in giant cells, and in the granulation tissue of the corium.

Organism Cultivated.—From seven cases the organisms have been cultivated. They fall into three groups: (1) the yeast-like, resembling those of Hektoen, Hessler, Busse and Curtis; (2) the oidium-like; (3) the mold-fungus type, resembling the organism isolated by Ophulis and Moffit from the protozoic (?) disease. Study shows that all these have common generic properties, and are separated only by specific characteristics which are more or less variable. In accordance with pre-existing nomenclature they all belong to the genus oidium. "Blastomyces" is considered not sufficiently inclusive. Pure cultures inoculated into animals produce local abscesses, septicemia, or if injected into veins, mycotic nodules and consolidation in the lungs. The various methods of proliferation in cultures are, germination, lateral conidia, terminal spore-groups, abjunction of mycelial segments, aerial conidium-bearing hyphæ (in the mold-fungus), and questionable endogenous spore-formation.

Of many inoculations of tissue from man into guinea-pigs, none have resulted in tuberculosis. A study of Busse's case of "Sacro-mycosis hominis," of the protozoic (?) disease of Wernicke, Gilchrist, Ophulis and Moffit, and others, and of Blastomycetic dermatitis, together with the fungi concerned in

all, affords convincing evidence that the three are closely related processes, caused by similar organisms; the protozoic (?) disease and *Saccharomycosis hominis* (Busse) are examples of the generalized infection, while *Blastomycetic dermatitis* (Gilchrist) is a local manifestation of the disease.

The term *Oidiomycosis* is suggested as a name for the combined manifestations.

Dr. Maxmillian Herzog said that if so many varieties of organisms are found in cases of clinical blastomycetic dermatitis, they can not be a single disease which is due to a single cause.

Dr. Ricketts in closing said he did not insist on the use of the term *oidiomycosis*. He considered the protozoan diseases as due to an organism very closely related to the ones under consideration.

Infection by the *Bacillus Aerogenes Capsulatus*.—Dr. L. M. Loeb reported two cases of this infection. (1) A compound fracture of both bones of the forearm was followed by emphysema of the whole extremity in two days. Recovery took place uninterruptedly after shoulder amputation. (2) An abrasion of the outer side of the knee was followed in one day by phlegmonous emphysema of the entire leg and by constitutional symptoms of profound intoxication. Fifteen to twenty short incisions were made and drainage of bichloride dressings employed. In ten days gas bacilli and emphysema were gone and recovery interrupted only by a suppuration of the knee joint took place. This case again brings up to consideration the more conservative methods of treatment.

Dr. L. F. Barker spoke on the circumstances of the discovery of the organism. He urged early recognition of the disease and treatment.

Dr. H. Gideon Wells mentioned a case in which the emphysema was first noticed in the subcutaneous tissue of the left shoulder, extending some distance in the course of a few days. Because of the finding of pulmonary tuberculosis, it was suspected the emphysema was due to a tuberculous abscess connected with the chest wall which had ruptured. At autopsy this was found to be not the case, but due to the *bacillus aerogenes capsulatus*.

BOOK REVIEWS.

A TEXT-BOOK OF PHARMACOLOGY AND THERAPEUTICS, or the action of Drugs in Health and Disease. By ARTHUR R. CUSHNEY, M.A., M.D., Professor of Materia Medica in the University of Michigan. Second Edition. Lea Brothers & Co., Philadelphia and New York.

To cut loose from established precedent and to weed out superfluities and ruthlessly annihilate antique dogmas take a large amount of courage even in a text-book writer. It is because Dr.

Cushney has had the courage of his convictions that, from certain standpoints, he has given us perhaps the best text-book on pharmacology that the English-speaking student can obtain.

It is for its distinctly modern tone that this text-book is to be praised. Recent workers in pharmino-dynamics have established many truths which are largely antagonistic to old-fashioned dicta and it is refreshing to read a work, which, while it does breathe an atmosphere of therapeutic pessimism, does so in no critical nihilistic sense, but in the desire to know truths that may serve as rational grounds for treatment. Hence he rejects many of the old teachings regarding the uses of alkalies and acids, the peculiar effects of bitters and many other routine procedures born of empiricism.

The workers in the field of theoretical chemistry, Nernst, Ostwald and others, have opened up a new vista in pharmino-dynamics and Dr. Cushney has seen fit, and wisely, to incorporate in this work the teachings in this new field which offers much promise in future therapeutics. While much of it is as yet vague, and expressed therefore with great difficulty, in which regard our author has often not helped matters, yet the time is not far distant when the student of drug activities must thoroughly comprehend the theories of ionization and their significance in the giving of drugs for remedial purposes.

We would desire to see in Dr. Cushney's work a more intimate commingling of the results of the laboratory to bedside work, but if this is impossible, we believe that the practitioner who thoroughly understands drug-action, as outlined in a book of this kind, is infinitely better prepared to treat any condition than one whose brain is a storehouse of prescriptions.

BOOKS RECEIVED.

The MEDICAL NEWS acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the MEDICAL NEWS will shortly appear.

A SYSTEM OF PRACTICAL THERAPEUTICS. Edited by Dr. H. A. HARE. Second Edition. Vol. II. Fevers, Diseases of Respiratory, Circulatory and Digestive Systems. Diseases of Kidneys, Nervous System and the Skin. 8vo, 926 pages. Lea Brothers & Co., Philadelphia and New York.

THE INTERNATIONAL MEDICAL ANNUAL 1901. Nineteenth year. 8vo, 682 pages. E. B. Treat & Co., New York and Chicago.

FIRST AID TO THE INJURED AND AMBULANCE DRILL. By S. H. Drinkwater. 12mo, 104 pages. Illustrated. Aldine House, London.

A LABORATORY GUIDE IN ELEMENTARY BACTERIOLOGY. By Dr. W. D. Frost. 8vo, 205 pages. Published by the Author. Madison, Wisconsin. \$1.60.

TWENTY-FIFTH ANNUAL REPORT OF THE MANAGERS AND OFFICERS OF THE NEW JERSEY STATE HOSPITAL AT MORRIS PLAINS. For the year ending Oct. 31, 1900.

SEVENTH ANNUAL REPORT OF THE BOARD OF MANAGERS OF THE CRAIG COLONY FOR EPILEPTICS.

NURSING, ETHICS FOR HOSPITAL AND PRIVATE USE. By Isabel Hampton Robb. Demi 8vo, 275 pages. J. B. Savage, Cleveland, Ohio. \$2.00.